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February 1997

# Installation-Specific Tracking Information (TRACKER) Tool

## Version 1.0 User's Manual

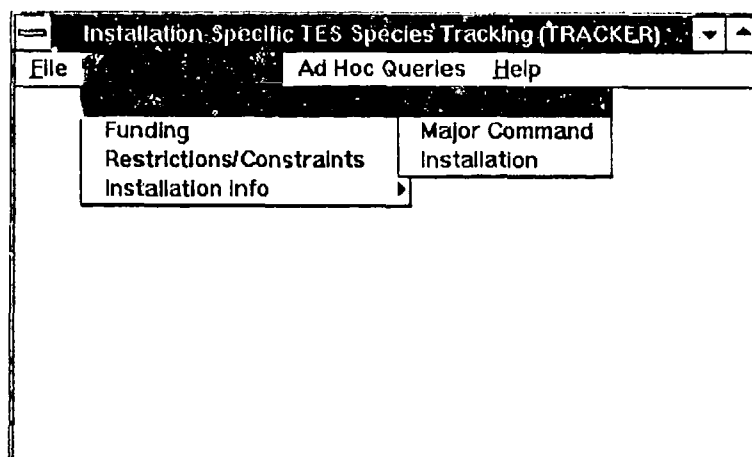
by  
Georgia Sebesta and Alison Hill

The Installation-Specific Tracking Information (TRACKER) program helps installation and headquarters personnel access annual information pertaining to threatened, endangered, and sensitive (TES) species that reside on Army lands. The TRACKER tool is a front end, graphical user interface that accesses the TES species database, and consists of two distinct, standalone components, or executable files. One component, the query and summary tool, retrieves and summarizes information on species occurrence, funding, mission constraints, acreage restrictions, and general installation information.

The second component, automated input forms, facilitates the entry of information into a temporary database, to be used by the query tool for data summaries.

TRACKER 1.0 requires a 386 IBM-compatible, 33 MHZ personal computer, with a minimum of 8 MB of random access memory (RAM), VGA capabilities, and 15 MB of hard drive space. The system must be equipped with MS-DOS 3.0 or above, and Windows 3.1 or above.

This manual contains instructions for installation and use of the system and conducting search/retrieval queries for analysis and reporting.



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## Foreword

This study was conducted for the Office of the Directorate of Environmental Programs (ODEP), Assistant Chief of Staff for Installation Management (ACS(IM)) under Funding Acquisition Document (FAD) No. 95-080002 dated 3 October 1994, "Environmental Quality Technology"; Work Unit UA5, "TES System and Applications." The technical monitor was Phillip Pierce, DAIM-ED-R.

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# 1 Introduction

## Background

According to Boice and Kaiser (March 1996), over 400 distinct candidate and listed plant and animal species are known to occur on approximately 12 million acres of military land managed by the Army. Army-wide information on threatened, endangered, and sensitive (TES) species is generally scarce though and, when available, is not in a centralized location. Summarized trend information on various topics (e.g., species occurrence, funding, mission constraints, and restricted areas) is also not readily available. This information is, however, critical for establishing necessary baseline data on the status of TES species. Consequently, the U.S. Army Construction Engineering Research Laboratories (USACERL), in developing capabilities to enhance the military's ability to meet requirements of the Endangered Species Act (ESA), developed the TRACKER tool as a component of the TES Species Automated Information Management System (TESSAIMS) (Sebesta 1995). The TRACKER tool is designed to provide the military with an easy access tool, which will retrieve, summarize, and facilitate data entry of annual information on installations and their associated TES species.

The TRACKER tool is a front end, graphical user interface (GUI) that accesses the TES species database and is comprised of two distinct, standalone components, or executable files. Through the query component, the user can pull together and summarize installation-specific information concerning species occurrence, funding, acreage restrictions, mission constraints, and general installation facts. Automated input forms, the second component, provide an easy mechanism for data entry that ties directly into the database.

These components are designed to alleviate many existing problems and concerns. First, the mechanisms in place for various levels to retrieve information is slow and time consuming. The query component will allow data requests to be run in-house, therefore eliminating the middle step of going to an external source. Second, no easy to use or available automated data entry forms are available for TES species information, making the data archival process cumbersome and slow. The automated input forms component will eliminate the need for lengthy paper surveys as a means to gather current information and make the data archival process much

faster. Lastly, a good mechanism for the accountability of TES species on Army lands does not exist with regards to the ESA. A centralized database will solve this problem by providing a storage mechanism for annual information.

The TRACKER tool was designed for military use, from installation to headquarter level, and will benefit a variety of Army users. Installation personnel can use the automated input forms convenient to provide information directly into a database format. This information can then be used to summarize TES species data from their own installation and to other installations. With these summaries, communication among installations will likely increase. Headquarters and major Army commands (MACOMS) also benefit from data summaries through broad-scale trends. Information from available topic areas will also provide a good baseline for outyear planning and decisionmaking processes.

## **Objectives**

The TRACKER tool is intended to assist the military by providing a reference tool for baseline information on installations and their associated TES species. Specific objectives of the program are to:

- develop a centralized Army-wide database containing and archiving pertinent installation information with regards to TES species
- develop a query tool to retrieve and summarize this information
- develop an automated data entry application
- facilitate the maintenance of current TES species information for accountability with regards to the ESA
- store information on the impact of TES species on military readiness.

## **TES Species Automated Information Management System (TESSAIMS)**

USACERL has been working on the TES Species Automated Information Management System (TESSAIMS) (Appendix A) to help the Army answer TES species information needs. The three distinct components of TESSAIMS:

1. Biodiversity and TES Species Experts (BioTES) (Sebesta and Hill 1996a)
2. Species-Specific Biological Information (SSBI) (Sebesta and Hill 1996b)
3. TRACKER

provide a variety of resources and capabilities to the military user community. BioTES is a searching mechanism that provides information on experts, individuals and organizations in the areas of biodiversity and TES species. SSBI is an interface for species-specific biological information on TES species. TRACKER is a front-end GUI that accesses the TES species database. The entire system, comprised of all three programs, will provide good baseline information for all levels within the military.

## Approach

The approach for TRACKER included five basic stages:

1. Determine the basic knowledge available from the installations with regards to TES species.
2. Find and compile the information.
3. Assemble the TES species database.
4. Develop an access tool for the database.
5. Internal and external testing.

To determine and compile information available from the installations, a broad topic survey was distributed to several Army organizations, including the environmental offices, military trainers, and the Judge Advocate General (JAG) office. Responses were then compiled and entered into a centralized database. Concurrently, decisions on application development (e.g., platforms, development tools, database engines, etc.) were also being discussed and made.

Application development consisted of three steps. First, the functionality and capabilities of the application were modeled on paper. The model included the Window's elements (e.g., windows, dialog boxes, buttons, etc.), application flow, and information flow. Review meetings held throughout the development process served to test functions of the application, offered additional features, and checked for consistencies with the other TESSAIMS components. The final step of the application development process was to finish the prototype.

After the initial GUI development stages were complete, internal testing was performed to validate both the information and the application. Internal testing comprised five stages:

1. Choose a group of knowledgeable experts in the area of natural resources and application development.



2. Distribute the application.
3. Obtain general responses.
4. Analyze response comments.
5. Modify both the database and application as necessary.

The TRACKER tool has completed all internal testing and is now ready to be tested externally by the user.

## Scope

An understanding of the scope of the TES species database and TRACKER tool is essential. In the summer of 1992, a survey was sent to over 170 Army installations, covering a broad spectrum of topic areas. From survey responses, over 750 TES and other related species were entered into the TES species database. The five most common topic areas (species occurrence, funding, mission constraints, restricted acreage, and general installation information) were included in the TRACKER component. However, during the validation and verification process, some records were deleted. Therefore, not all topic areas have the same subset of installations.

In this first version, TRACKER 1.0, information from the Automated Input Forms component is entered into a temporary database. However, the user is not allowed to make automatic updates to the TES species database. Therefore, the temporary database must be sent to a support center (e.g., the Army Environmental Center) where it can be entered into the centralized TES species database.

## Mode of Technology Transfer

Additional copies of TRACKER software can be obtained from USACERL. For technical support when using the TRACKER tool, or for further information about the program, contact Dr. Alison Hill, USACERL at (217) 398-5218 or 1-800-USA-CERL, or write to USACERL, Attn: Alison Hill/LL-N, P.O. Box 9005, Champaign, IL 61826-9005.

## 2 Using the Manual

### Organization and Assumptions of the Manual

The next five chapters provide the system description, instructions on installation and use of the TRACKER tool, and application requirements. Chapter 3 provides instructions for PC system configuration, software requirements, and the installation process. Chapter 4 deals with the general background of the TRACKER tool. Chapters 5 and 6 explain how the Query and Summary component and the Automated Input Forms component work, respectively. Chapter 7 describes related tables, specific data elements, and the data collection process within the database. Chapter 8 documents initial application development decisions for further understanding of how the TESSAIMS works.

The TRACKER tool user's manual is written with the assumption that the user has a basic understanding of Microsoft Windows 3.1 and MS-DOS 3.0 or above. If further information is needed on using Windows or DOS, refer to the appropriate user's manual.

### Document Syntax

Instructions, cross-references, and syntax of this manual will help the user navigate through the TRACKER applications. Some instructions are repeated within the various sections, and cross-referenced, so individual topics can be presented in their entirety. The following syntax items will be used throughout this manual:

- |                      |   |
|----------------------|---|
| <b>&lt;Text&gt;</b>  | Text written between carats < > refers to various actions including menu selections, button controls, and key strokes.                        |
| <b>TEXT</b>          | Text written in all capital letters refers to file names, directories, or database elements, including table names, fields, and column names. |
| <b><i>Italic</i></b> | Text in italic refers to tables or data elements that are not currently populated.  |

A few terms in this manual are used repeatedly that refer to the same concept. These terms include:

Synonyms	Definition
Prototype, Application, Program, Front-End	Prototyped application
Exit, Close, Cancel	Leave dialog box, window, or program without any further actions
Data, Information	Specific information from the database

## 3 Installing the Program

### System Requirements

To use the TRACKER tool you will need:

- Any IBM-compatible machine with a 386 processor or higher
- 8 MB RAM
- Hard disk with 15 MB free disk space
- Windows 3.1 running in enhanced mode
- MS-DOS 3.0 or above
- VGA graphics adapter and monitor
- A mouse

### Software Requirements

The TRACKER tool requires two commercially available software packages to run. Recommended software for using TRACKER is the SQLBase database engine (Version 5.1.2) by Gupta Technologies, Inc., and the ODBC Driver Pack (Version 1.0) by Q+E Software/Intersolv Inc. The ODBC Driver Pack is not the only available source for drivers; however, it works well and is the only one tested so far. These commercial applications support the TES species database and links from the application to the database. For installing these commercial packages, refer to the appropriate user's manual. However, for proper setup, the SQLBase database engine must be installed first and then the ODBC Driver Pack. When installing the ODBC Driver Pack, select the drivers for SQLBase.

### Installation Process

The program is distributed on 3.5 in. diskettes. To install these files, Windows 3.1 must be running on the computer. Before installing TRACKER 1.0, you may want to create a backup copy of the installation disks, as an added precaution in case of accidental data loss.

1. Start Windows if you have not already done so.
2. Insert the Install 1 disk into drive A (or drive B).
3. Select <Run> from the <File> menu in the Windows Program Manager.
4. Type a:\instalit (or b:\instalit), then choose OK (Figure 1).

A dialog box will then prompt for the desired directory in which the installation files should be stored. The INSTALIT program will automatically install all front end program files and database files to a default setting or an alternate directory may be chosen.

Six installation directories will be created and/or used, if necessary: \TRACK, \INPUT, \SQLBASE\TES, \SQLBASE\TESDATA, \WINDOWS, and \WINDOWS\SYSTEM. The \TRACK and \INPUT directories contain necessary application files. The \SQLBASE\TES directory contains the centralized database, and the \SQLBASE\TESDATA directory contains the data entry database. Necessary libraries and links to the database and programs that run under Windows can be found in the \WINDOWS and \WINDOWS\SYSTEM directories. INSTALIT will only add necessary files and will not overwrite current directories. If duplicate files are found, a dialog box will appear asking you to confirm replacing the file. However, in most cases, it is not advisable to replace current files. These steps complete the installation program.

If the C:\ Drive was not chosen, two files will have to be modified once the installation program is complete. First, in the path statement of the AUTOEXEC.BAT or BOOTPATH.BAT file, the user will need to add the directory chosen for the program (e.g., D:\TRACK or D:\INPUT), and verify that Windows is in the path. Secondly, the user will need to modify the ODBC.INI file (see Table 1), located in the WINDOWS directory. The path for the WINDOWS drivers may also need to be modified (e.g., from C:\WINDOWS\SYSTEM\QFEGUP03.dll to D:\WINDOWS\SYSTEM\QEGUP03.dll).

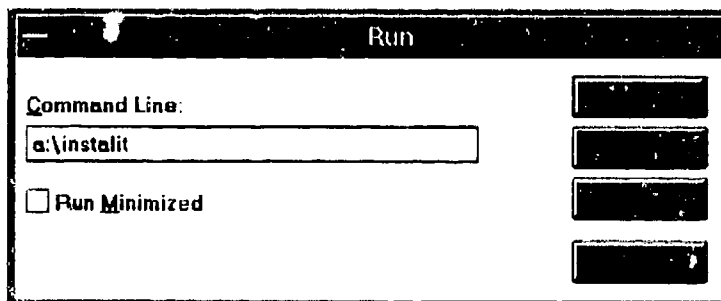


Figure 1. Using the Program Manager's RUN to Install TRACKER.

## Creating a Windows Icon

The installation process does not automatically create an icon for each application. Therefore, two icons will have to be created for the TRACKER tool, one for the Query and Summary component and another for the Automated Input Forms component. To create a Windows icon, first select or create a program manager group for the icon to reside in. To create a new program group, select <New> from the Program Manager menu, under <File>. In the dialog box that appears, click on "Program Group" and then the <OK> button. Next, the Program Group Properties dialog box will open. The only information necessary to create a new program group

is the Description, which can be any meaningful title the user desires. Once a title has been entered, click on the <OK> button. The new program group window should appear. To create the application icon, select <New> from the Program Manager menu, under <File>. In the dialog box that appears, click on "Program Item" and then the <OK> button. A dialog box will then prompt for two pieces of information about the application the icon represents. The Description is the descriptive title of the application (e.g., Query and Summary component or Automated Input Forms component). The Command Line is the location of the executable file (e.g., C:\T-Q&S\TRACK.EXE or C:\INPUT\INPUT.EXE). Once this information has been entered, click on the <OK> button, and the icon will appear in the selected program group. For more information on this topic, refer to the Windows user's manual.

**Table 1. ODBC.INI example file and necessary lines for TRACKER.**

```
[ODBC Data Sources]
QEGUP=Q+E SQLBase

[QEGUP]
Driver=C:\WINDOWS\SYSTEM\QEGUP03.dll
Description=
Database=TES
ServerName=LOCAL
Servers=
LogonID=
QEWSD=34574
yieldproc=1

[QEGU1]
Driver=C:\WINDOWS\SYSTEM\QEGUP03.dll
Description=
Database=TESDATA
ServerName=LOCAL
Servers=
LogonID=
QEWSD=34574
yieldproc=1
```

## TESSAIMS Applications Installation Overlap

For users who install more than one component of TESSAIMS, the ODBC.INI file (Table 2) will contain additional lines that differ with each application. Instructions for modifying this file are similar to those mentioned above for the TRACKER installation process. However, the appropriate path must be designated in this file

for the individual components to work properly. To ensure that the ODBC.INI file is entered correctly, the user's manual for each component of TESSAIMS contains the appropriate lines for the ODBC.INI file according to each application.

**Table 2. ODBC.INI example file and necessary lines for TESSAIMS.**

```
[ODBC Data Sources]
QEDBF=Q+E dBASEFile (*.dbf)
QEGUP=Q+E SQLBase

[QEDBF]
Driver=C:\WINDOWS\SYSTEM\simba.dll
FileType=dBase4
DataDirectory=c:\dbase2
SingleUser=True

[QEGUP]
Driver=C:\WINDOWS\SYSTEM\QEGUP03.dll
Description=
Database=TES
ServerName=LOCAL
Servers=
LogonID=
QEWSID=34574
yieldproc=1

[QEGU1]
Driver=C:\WINDOWS\SYSTEM\QEGUP03.dll
Description=
Database=TESDATA
ServerName=LOCAL
Servers=
LogonID=
QEWSID=34574
yieldproc=1
```

## 4 Tracker Application

The TRACKER tool is designed to access installation-specific TES species information from a centralized database. In this case, access means both retrieving and entering information. Accessing mechanisms for TRACKER are comprised of two distinct applications, the Query and Summary component and the Automated Input Forms component. The Query and Summary component provides an easy access mechanism to retrieve and summarize information from the database. The Automated Input Forms component provides a mechanism to easily enter the necessary information for the other component. Chapters 5 and 6 explain these components in more detail.

### Starting the Applications

To start either application, double click on the appropriate TES species icon. If icons are not available, read the instructions for **Creating a Windows Icon** in Chapter 3. When selected, each application will begin with an introductory dialog box—Figure 2 for the Query and Summary component or Figure 3 for the Automated Input Forms component. The dialog box states the application title, release version and date, funding source, and development information. Proceed by clicking on the <OK> button or <Cancel> button (respectively), located in the lower righthand corner.

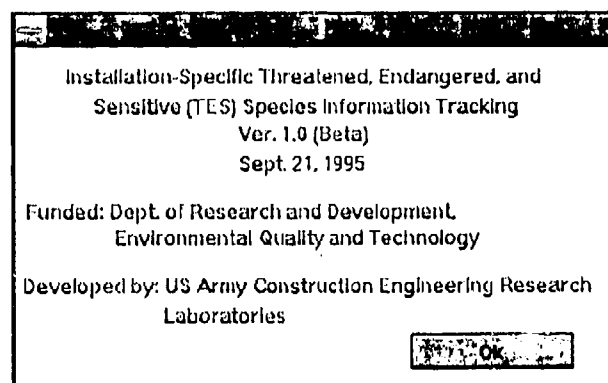


Figure 2. Introduction Dialog Box for TRACKER's Query and Summary component.

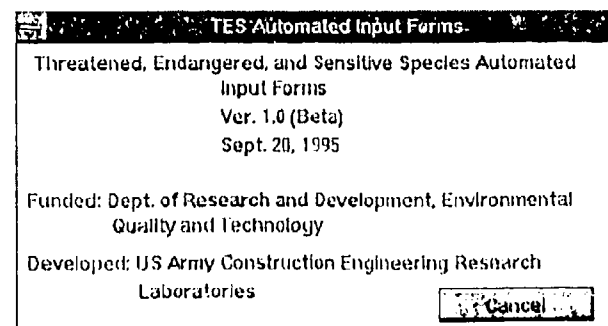


Figure 3. Introduction Dialog Box for TRACKER's Automated Input Forms.



## 5 Using the Query and Summary Component

This chapter explains how the Query and Summary component works according to the main menu. The main menu options at the top of the TRACKER Program Manager window (Figures 4 and B1) are visible when the program starts. Main menu options include: <File>, <Canned Queries>, <Ad Hoc Queries>, and <Help>. The following sections describe each menu selection, with two query mechanisms, <Canned Queries> and <Ad Hoc Queries>, comprising most of the discussion. The <Canned Queries> menu encompasses the most frequently requested installation and TES species summaries from each topic area (species occurrence, funding, restricted acreage, mission constraints, and installation information). The <Ad Hoc Queries> menu assists the user in developing specialized queries on species occurrence information. The menu flow for topic areas within each query mechanism is diagrammed in Appendix B.

### File Menu - Exiting the Program

The <Exit> command (Figure 4) under <File> closes and ends the program.

### Canned Queries

The <Canned Queries> mechanism (Figure 5) is used to summarize the most frequently requested information from the database. Topic areas covered by the Canned Query mechanism include: species occurrence, funding, restricted acres/mission constraints, and general installation information. Each topic area has a unique query dialog box that summarizes a variety of information (Appendix C).

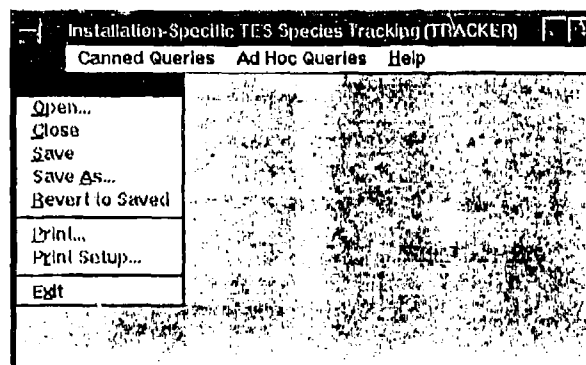


Figure 4. <Exit> Menu selection.

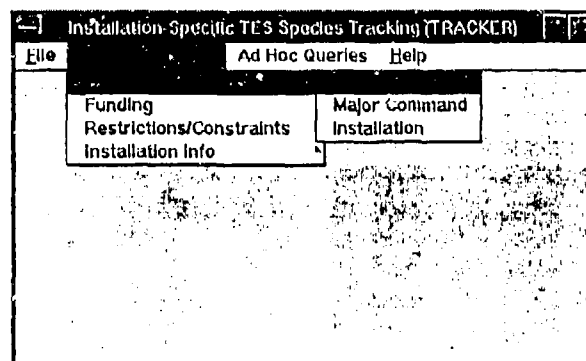


Figure 5. <Species Occurrence> Menu.

Parameters for these summaries are selected by the user to obtain output information and help narrow the scope of the data request. One of the initial parameters chosen is that of the organizational level of interest (Service, Major Command, or Installation) (Figure 5). While reading through each query mechanism, the user may want to review the associated flow diagrams in Appendix B and the summarized table in Appendix C to understand the relationship between the input and output summaries.

Dialog boxes for <Species Occurrence>, <Funding>, and <Restrictions/Constraints> menus have three similar list boxes (Selection within Level, Federal Status, and Year). Depending on the organizational level chosen, the Selection within Level list box will list all appropriate Services, Major Commands, or Installations from the database (e.g., Army, Air Force, etc.) (Figure 6). The Federal Status list box limits the information to species with a particular Federal status (Candidate, Threatened, Endangered, Threatened and Endangered, or All Listed Species) that the user chooses. The Year list box refers to a particular year date stamp for data in the database. In addition to these list boxes, each dialog box has a common edit box that stores the menu selection organizational level chosen at the start of the Canned Query mechanism. The following sections describe how to access this information and the unique features for each of the Canned Query topic areas: <Species Occurrence>, <Funding>, <Restrictions/Constraints>, and <Installation Info>.

### ***Species Occurrence***

**Description of output information.** The Species Occurrence Canned Queries option (Figure 5) provides access to information that answers five basic questions on TES species occurrence (Appendix C) from three groups of information summaries: General List group box, Hot List group box, and the <Category Groups> button. The General List group box (Figure 6) provides a summary of the number of distinct TES species on individual installations (<Count>),

The screenshot shows a Windows-style dialog box titled "Species Occurrence Canned Queries". It features several interactive elements:
 

- Level Of Interest:** A text box containing "Major Command".
- Selection within Level:** A list box containing "DESCOM/AMC", "HSC", "MDW", "MTMC", "NGB", and "PACAF".
- Federal Status:** A list box containing "Candidates", "Threatened", "Endangered", and "All Listed".
- Year:** An empty list box.
- General List:** A group box containing "Count" and "Species" buttons.
- Hot List:** A group box containing "Installation" and "Species" buttons.
- Category Groups:** A group box containing a "Cancel" button.

Figure 6. Species Occurrence Canned Queries Dialog Box.



**How to access information.** Species occurrence information can be accessed through the <Canned Queries> menu, by clicking on the <Species Occurrence> option (Figure 5). The overall flow for this option is depicted graphically in Figures B1 and B2. By selecting one of the organizational levels, the Species Occurrence Canned Queries dialog box (Figure 6) is opened. The Level of Interest list box is automatically populated by the previous menu choice and can only be changed by selecting another menu choice.

Once the dialog box has been opened, the user must select at least one parameter from each of three list boxes (Selection within Level, Federal Status, and Year). Multiple selections are allowed only in the Selections within Level list box when using buttons in the General List group box or <Category Groups>. On the other hand, buttons in the Hot List group box allow only one selection from each of the three list boxes. Multiple noncontiguous selections within certain topic areas are made by holding the <Ctrl> key down while selecting the appropriate choices. Multiple contiguous selections within certain topic areas are made by holding the <Shift> key down while making the first and last selections.

Spreadsheet output screens for Species Occurrence Canned Queries (Figures 7, 8, 9, and 11) have three buttons in common: <Back>, <Copy>, and <Cancel>. The <Back> button returns the user to the previous dialog box, retaining the contents

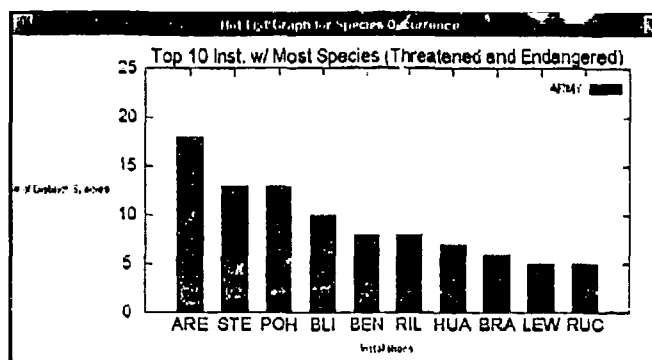


Figure 10. Example of graphical output for Hot List.

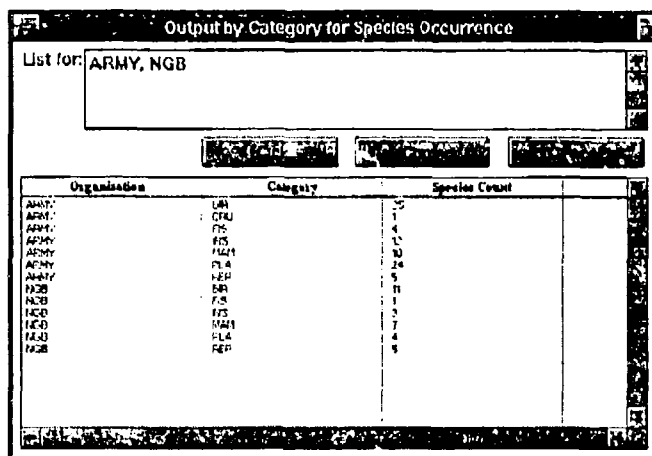


Figure 11. Spreadsheet output for <Category Groups>.

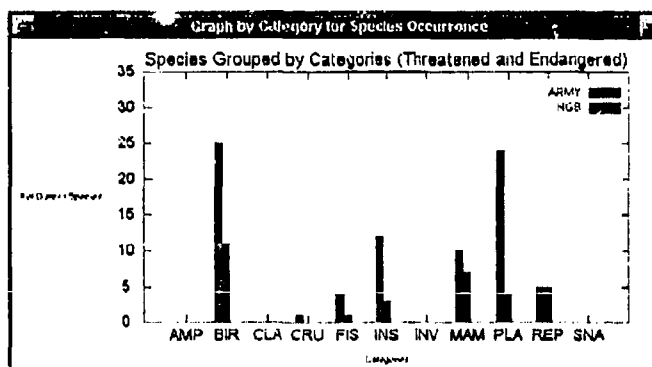


Figure 12. Graphical output for <Category Groups>.

of the Level of Interest list box. When using the <Back> button with spreadsheet and graph windows, both windows will close simultaneously and return the user to the Species Occurrence Canned Queries dialog box. The <Copy> button allows the user to copy selected spreadsheet contents to any wordprocessor or spreadsheet. Select the desired rows of information in the same manner as described above by using the <Ctrl> and <Shift> keys. The <Cancel> button will exit the user from this window, but not retain any of the information currently chosen. When using the <Cancel> button with spreadsheet and graph windows, only the spreadsheet window will be closed. The graph window must be closed separately by double clicking on the close box located in the upper lefthand corner.

### Funding

#### Description of output Information.

The Funding Canned Queries option (Figure 13) provides access to information that answers four basic questions on TES species funding (Appendix C) from two groups of information summaries, Top Ten group box and Funding Totals group box. The Top Ten group box (Figure 14) provides a summary of the top 10 installations with the most TES species funding (<Installation>), and the top 10 species that receive the most funding (<Species>). The <Installation> button provides a spreadsheet listing of the Installation, Installation Identification Code, and Funding Total (\$K) (Figure 15), while the graph (Figure 16) plots this output information. The <Species> button provides a spreadsheet listing of the Scientific Name, Species Identification Code, and Funding Total (\$K), while the graph plots this information. The Funding Totals

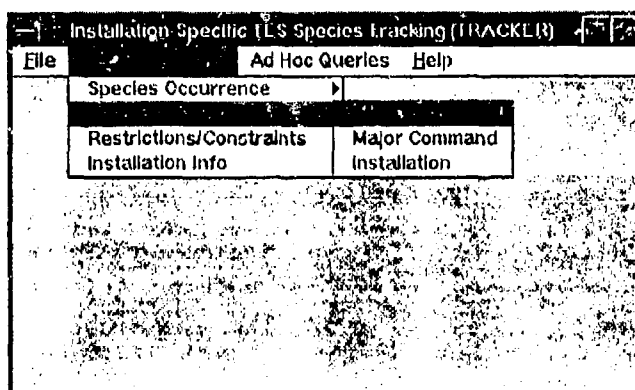


Figure 13. <Funding> Menu.

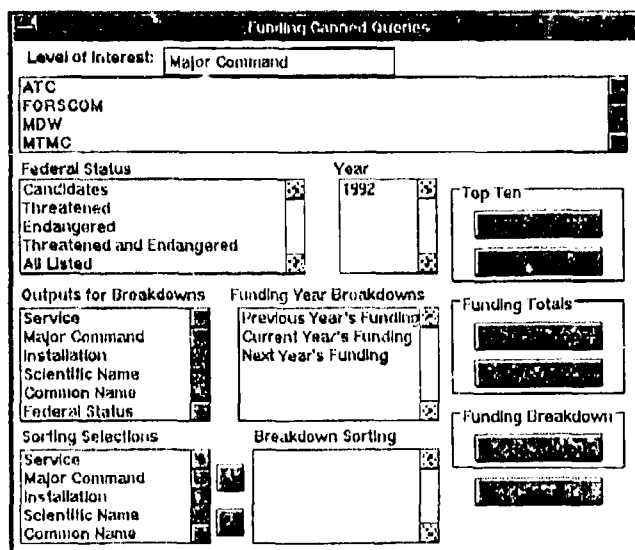


Figure 14. Funding Canned Query Dialog Box.

group box (Figure 14) contains two summaries that sort information on TES species funding either by taxonomic category <By Category> or by year <By Year>. Spreadsheet output information for the <By Category> button includes the Organization, Category, and Total Funding (\$K), while the graph plots these data. Spreadsheet output information (Figure 17) for the <By Year> button includes the Organization, Funding 1991 (\$K), Funding 1992 (\$K), and Funding 1993 (\$K). Figure 18 represents the total annual funding for TES species funding by year.

In addition to providing information on the four basic funding questions, an ad hoc query mechanism is provided through the Funding Breakdown group box (Figure 19). The ad hoc query mechanism provides the user a certain degree of freedom in defining and sorting output information parameters for summaries. Parameter choices include the Installation, Scientific and Common Name, Federal Status, Year, and Funding. The sorting order for output spreadsheet information can also be selected.

**How to access information.** TES species funding information for installations and related work efforts can be accessed through the <Canned Queries> menu by clicking on the <Funding> menu option (Figure 13). The overall flow for this option is depicted

Hot List for Funding

List for: FORSCOM

Installation	Installation Code	Funding Total (\$K)
FT IRVIN	KW	2000
FT LEWIS	HUN	121
FT LEWIS	LEW	275
FT HOO	HOO	196
FT POLK	POL	125
FT STEWART	STE	36
CAMP BULLIS/FT SAN HOUSTON	BUL	25
YAN WAFFLING CTR	YAN	25
FT CARSON	CAR	55
FT MEADE	MEA	0

Figure 15. Spreadsheet output for Top Ten <Installation>.

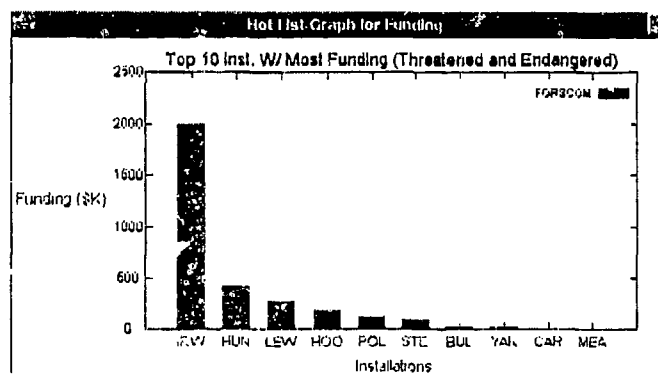


Figure 16. Graphical output for Top Ten <Installation>.

Output by Year for Funding

List for: FORSCOM, TRADOC

Organization	Funding 1991 (\$K)	Funding 1992 (\$K)	Funding 1993 (\$K)
FORSCOM	2000	390.5	1112
TRADOC	244	269	622

Figure 17. Spreadsheet output for Funding grouped by year.

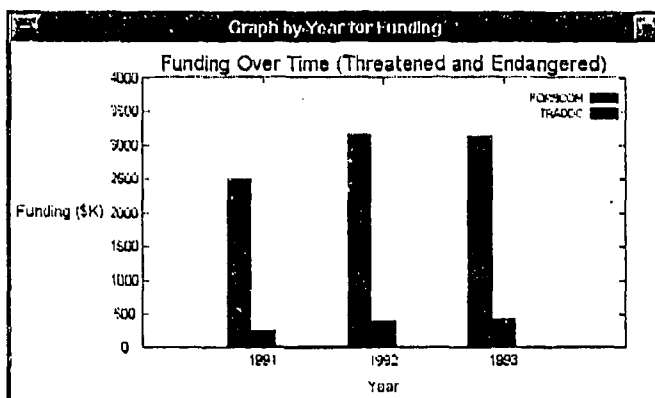


Figure 18. Graphical output for Funding grouped by year.

ous list boxes according to the desired output summary. The Funding Totals group box and Top Ten group box require entries in each of the three list boxes: Level of Interest, Federal Status, and Year. Multiple selections are allowed only in the Level of Interest list box. Multiple noncontiguous selections within certain topic areas are made by holding the <Ctrl> key down while selecting appropriate choices. Multiple contiguous selections within certain topic areas are made by holding the <Shift> key down while making the first and last selections.

The ad hoc output button (Figure 19) requires dialog box entries in each of seven list boxes, Level of Interest, Federal Status, Year, Outputs for Breakdowns, Funding Year Breakdowns, Sorting Selections, and Breakdown Sorting. The Level of Interest, Outputs for Breakdowns, Funding Year Breakdowns, and Breakdown Sorting list boxes allow multiple selections for this output summary. Both Sorting Selections and Breakdown Sorting list boxes are used together to define the

**Funding Canned Queries**

Level of Interest: Major Command

ATC

MDW

MTMC

Federal Status

Candidates

Threatened

Endangered

All Listed

Year

Top Ten

Outputs for Breakdowns

Service

Funding Year Breakdowns

Funding Totals

Sorting Selections

Service

Major Command

Installation

Common Name

Breakdown Sorting

Scientific Name

Funding Breakdown

Figure 19. Funding Canned Query Dialog Box for <Ad Hoc Output>.

graphically in Figures B1 and B3. Selecting one of the organizational levels opens the Funding Canned Queries dialog box (Figure 14). The Level of Interest list box is automatically populated by the previous menu selection and can only be changed by making another menu selection.

Once the dialog box has been opened, the user can select vari-

ous list boxes according to the desired output summary. The sorting order of the output information. To select a particular sorting element, highlight the selection in the Sorting Selections list box and click once on the <>> button to copy the chosen element to the Breakdown Sorting list box. The order of selections in the Breakdown Sorting list box will be the sorting order for the output information. If errors are made in the selection process, highlight the undesired selection in the Breakdown Sorting list box and click once on the <<< button to remove

the selection. Once the appropriate selections have been made in each of the seven list boxes, click on the <Ad Hoc Output> button to output the desired information to a spreadsheet format (Figure 20).

Spreadsheet output screens for Funding Canned Queries (Figures 15, 17, and 20) have three buttons in common: <Back>, <Copy>, and <Cancel>. The

**<Back>** button returns the user to the previous dialog box, retaining the contents of the Level of Interest list box. The **<Copy>** button allows the user to copy selected spreadsheet contents to any word processor or spreadsheet. Select the desired rows of information in the same manner as described above by using the **<Ctrl>** and **<Shift>** keys. The **<Cancel>** button will exit the user from this window, but not retain any of the information currently chosen. When using the **<Cancel>** button with spreadsheet and graph windows, only the spreadsheet window will be closed. The graph window must be closed separately by double clicking on the close box located in the upper lefthand corner.

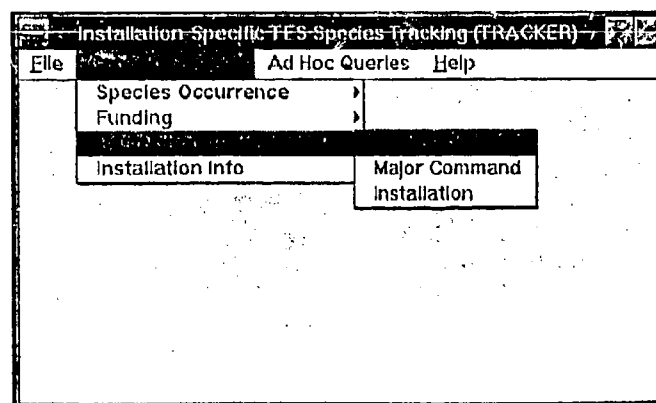
### ***Restricted Acres and Mission Constraints***

**Description of output information.** The Restrictions/Constraints Canned Queries option (Figure 21) provides the user with information on the number of restricted acres caused by TES species and how those species constrain current activities. Topic areas include:

1. Restricted Acres
2. Directorate of Engineering and Housing (DEH) overall mission constraints
3. Directorate of Planning and Training (DPT) training mission constraints
4. DPT non-training mission constraints.

[illegible]

**Figure 20. Output for Funding Breakdown <Ad Hoc Output>.**



**Figure 21. <Restrictions/Constraints> Menu.**



**Restricted Acreage and Mission Constraints Canned Queries**

Restriction or Constraint of Interest:

DEH - Overall Mission Constraints  
DPT - Training Mission Constraints  
DPT - Non-training Mission Constraints

Level Of Interest: Major Command

ACC  
AFB  
AMC  
AMCCOM  
ATC  
DESCOM/AMC  
FORSOM

Federal Status: Candidates  
Threatened  
Endangered  
Threatened and Endangered  
All Listed

Year: 1992

Top Ten

Summary

Figure 22. Acreage Restrictions Topic Area Dialog Box.

**General Output for Restricted Acres or Mission Constraints**

List for: FORSCOM

Installation	Installation Code	Total Restricted Acres (hours)
FT HOO	HOO	53
FT RW	RW	32
CAMP BULLIS/FT SAM HOUSTON	BUL	7.9
FT STEWART	STE	5.425
FT HITCHCOCK	HUN	3.5
FT ORD	ORD	2.8
FT LEWIS	LEW	0.02
YAF/MAF/FAWGCTA	YAF	0.07
FT CARSON	CAR	0.021
FT MCCOY	MCC	0

Figure 23. Spreadsheet output for Restricted Acres Top Ten &lt;Installation&gt;.

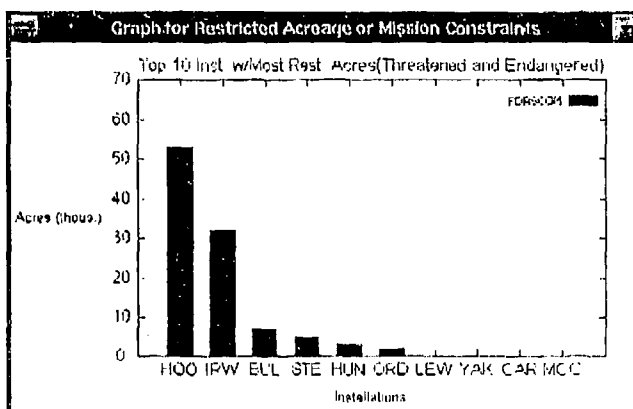


Figure 24. Graphical output for Restricted Acres Top Ten &lt;Installation&gt;.

Information for both training and non-training DPT mission constraints are measured in the same output format (increased, decreased, and unchanged since last year), and will therefore be referred to in the same context for the remainder of this section.

The Restricted Acres Canned Queries option (Figure 22) provides access to information that answers five general questions (Appendix C), via two group boxes—Top Ten and Summary. The Top Ten group box provides a summarized spreadsheet listing of Top Ten installations with the most restricted acres caused by TES species (<Installation>) and Top Ten individual TES species that restrict the most acres (<Species>). The <Installation> button provides a spreadsheet listing (Figure 23) and graph (Figure 24) of the installations and the total number of restricted acres. The <Species> button provides a spreadsheet and graph for the TES species and the total number of restricted acres. The Summary group box (Figure 25) provides answers to three questions in spreadsheet format:

1. How many acres are restricted on distinct installations (<Level>)?
2. How many acres are restricted by distinct species on installations (<Species>)?

3. How many acres are restricted by various taxonomic categories (<Category>)?

A spreadsheet listing (Figure 26) and graph (Figure 27) are also available for Restricted Acreage by Category.

The DEH overall mission constraints topic area (Figure 28) shows the annual trends in DEH mission constraints from TES species. The Summary group box provides information on the trends in overall mission constraints by all TES species, as stated by the environmental staff (<Level>). The <Level> button presents a spreadsheet listing (Figure 29) and graph (Figure 30) that includes Organization, Mission Constraints, and a Count of Installations.

Three questions are addressed (Appendix C) when selecting either DPT training or non-training mission constraints topic areas (Figures 31 and 32). The Summary group box consists of three distinct summaries of training and non-training activities, as reported by military trainers:

1. Trend in mission constraints by all TES species on distinct installations (<Level>)
2. Trend in mission constraints on distinct installations by individual TES species (<Species>)
3. Trend in mission constraints by TES species on installations

General Summary for Restricted Acreage and Mission Constraints

Restricted Acres

Installation	Restricted Acres (thous.)	Total Installation Acres (thous.)
DAVID B. RUSSELL SAMHOUSTON	7.5	27.86
FT CARSON	0.01	154.81
FT HOOB	50	217.337
FT H. KETER LODGETT	0.5	16.6
FT RUSK	32	640
FT LEWIS	0.01	640
FT MCLOY	0	83.772
FT MACE	0	23.711
FT MO	0.4	28
FT RILEY	0	100.040
FT STEWART	5.426	2.75
PRESTON-DUNHAM/ATER SITE	0	244
VAN HANFORD CTB	0.07	0.44

Figure 25. Output for Summary, <Level>, on Restricted Acres.

Output by Category for Restricted Acreage or Mission Constraints

Restricted Acres

List for: FORSCOM, TRADOC

Organization	Category	Total Restricted Acres (thous.)
ARMY/DEH	PS	66.965
ARMY/DEH	PS	0.11
FORSCOM	PS	2.6
FORSCOM	MMH	3
FORSCOM	PLA	0
FORSCOM	REP	3.2
TRADOC	HR	4.162
TRADOC	RS	0
TRADOC	MMH	9.403
TRADOC	PLA	0
TRADOC	REP	0

Figure 26. Spreadsheet output for Restricted Acreage grouped by category.

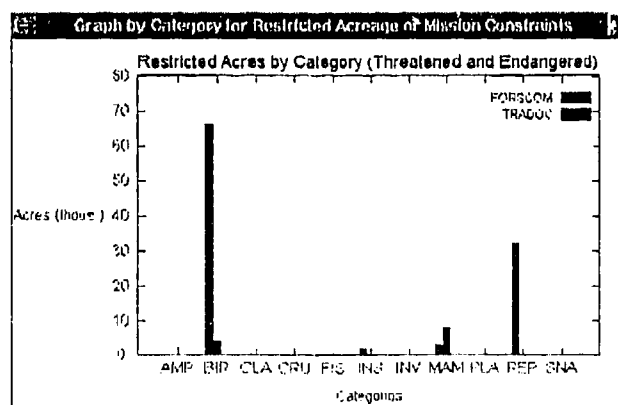


Figure 27. Graphical output for Restricted Acreage grouped by category.

Restricted Acreage and Mission Constraints Canned Queries

Restriction or Constraint of Interest:  
 Restricted Acres  
 DPT - Training Mission Constraints  
 DPT - Non-training Mission Constraints

Level Of Interest: Major Command

AGC  
 AFB  
 AMG  
 AMCCOM  
 ATC  
 FORSCOM  
 HSC

Federal Status:  
 Candidates  
 Threatened  
 Endangered  
 Threatened and Endangered  
 All Listed

Year: 1992

Top Ten

Summary

Figure 28. DEH Overall Mission Constraints Topic Area Dialog Box.

General Output for Restricted Acres or Mission Constraints

List for: FORSCOM, TRADOC

Organization	Mission Constraints	Installation Count (#)
FORSCOM	Increased	4
FORSCOM	Unchanged	18
TRADOC	Increased	3
TRADOC	Unchanged	11

Figure 29. Spreadsheet output for DEH Overall Training Mission Constraints (Summary <Level>).

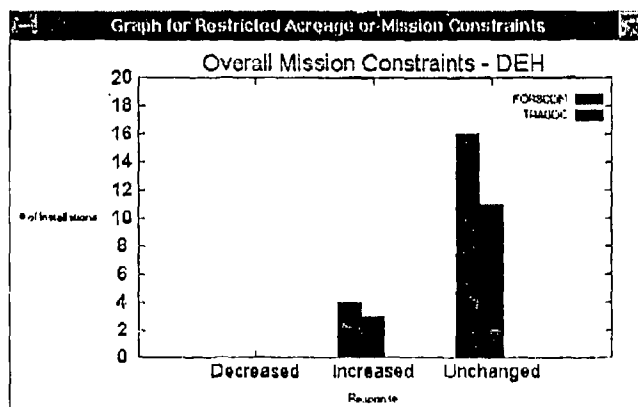


Figure 30. Graphical output for DEH Overall Training Mission Constraints (Summary <Level>).

grouped by category (<Category>).

The <Level> button presents a spreadsheet listing (Figure 33) and graph (Figure 34) that includes the Organization, Mission Constraints, and a Count of Distinct Species on Individual Installations. The <Species> button (Figure 35) presents a spreadsheet listing of the Organization, Scientific Name, Common Name, and Mission Constraints. The <Category> button organizes the information by taxonomic category, and presents the information in a spreadsheet (Figure 36) and graph (Figure 37) format.

**How to access Information.** Restricted Acres and Mission Constraints information can be accessed through the <Canned Queries> menu by clicking on the <Restrictions/Constraints> option (Figure 21). The overall flow for this option is depicted graphically in Figures B1 and B4. Selecting one of the organizational levels opens the Restricted Acres and Mission Constraints Canned Queries dialog box (Figure 22). However, before proceeding, the user must select one of the four topic areas from the list box. This selection will define the output information available, including Top Ten and Summary information, and information in the Level of Interest list box. If a

particular output summary or parameter (e.g., list box or button) is not available for the information topic, it will be grayed out and inaccessible.

Once a topic area has been selected, the Level of Interest list box will be populated with the organizational level that was selected earlier. The Restricted Acres option (Figure 22) requires information parameters from each of the three list boxes (Level of Interest, Federal Status, and Year). The Top Ten group box allows only single selections in each of the three list boxes; whereas the Summary group box allows multiple selections, but only in the Level of Interest list box. The DEH Overall Mission Constraints option (Figure 28) has only one button available, <Level>, but multiple selections can be made in the Level of Interest list box. Both DPT options, Training Mission Constraints (Figure 31) and Non-Training Mission Constraints (Figure 32) use all available buttons in the Summary group box. Multiple selections can be made in the Level of Interest list box when using the <Level> and <Species> buttons, but only single selections can be made for Federal Status and Year. The <Category> button, on the other hand, allows only single selections in each of the three list

Figure 31. DPT Training Mission Constraints Topic Area Dialog Box.

Figure 32. DPT Non-Training Mission Constraints Topic Area Dialog Box.

Organization	Mission Constraints	Species Count (#)
FORSCOM	Increased	2
TRADOC	Unchanged	11
TRADOC	Unchanged	6

Figure 33. Spreadsheet output for DPT Training Mission Constraints (Summary <Level>).



window will be closed. The graph window must be closed separately by double clicking on the close box of that window.

### General Installation Information

**Description of output Information.** The Installation Information Canned Queries option (Figure 38) provides access to general information on installations (Appendix C). Available information includes the Installation name, Service, Major Command, State, Counties, and Total Acreage (Figure 39). Output information from the two organizational levels, <Service> and <Major Command>, is listed in spreadsheet format (Figure 40).

**How to access information.** Installation information can be accessed through the <Canned Queries> menu, by clicking on the <Installation Info> option (Figure 38). The overall flow for this option is depicted graphically in Figures B1 and B5. Selecting one of the organizational levels opens the Installation Canned Queries dialog box (Figure 39). The Search Level list box is automatically populated by the previous menu choice and can only be changed by selecting another menu choice.

Once the dialog box has been opened, the user can select

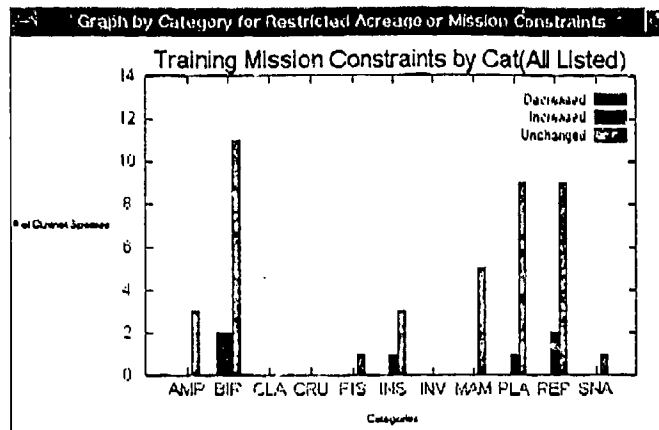


Figure 37. Graphical output for DPT Training Mission Constraints grouped by category (Summary <Category>).

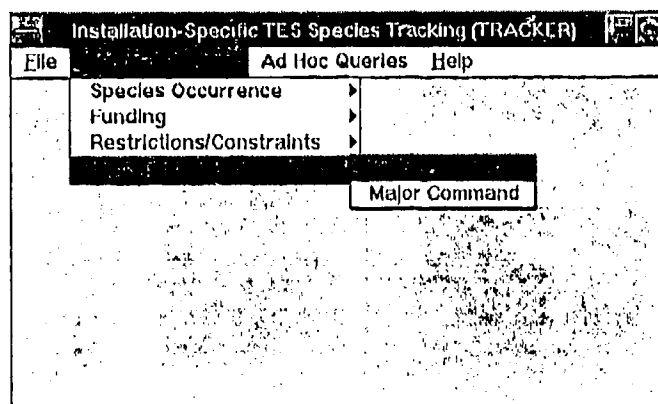


Figure 38. <Installation Info> Menu.

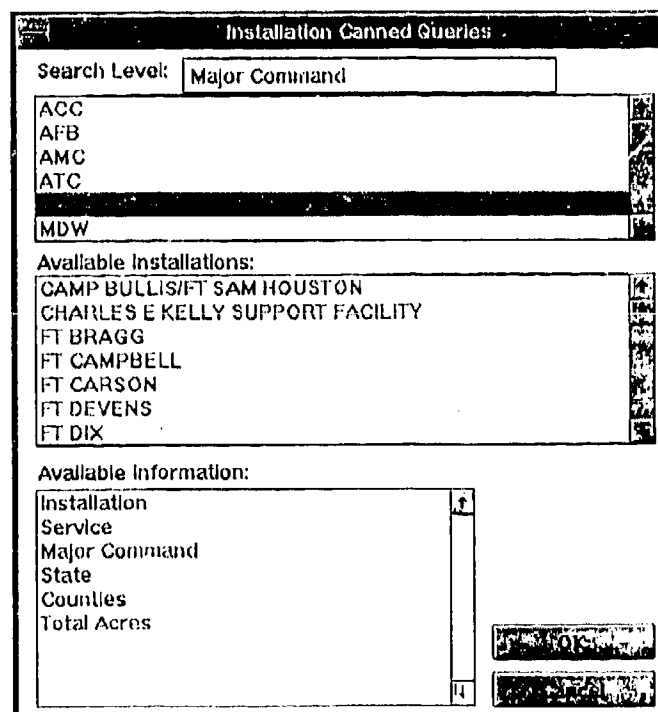


Figure 39. Installation Information Canned Query Dialog Box.

General Output for Installation Information			
		<input type="button" value="Copy"/> <input type="button" value="Back"/> <input type="button" value="Cancel"/>	
Installation	State	Total Acres	
FT DEVENS	MA	9289	
FT DIX	NJ	32000	
FT DRUM	NY	107265	
FT GILLEM	GA	1326	
FT HODD	TX	217337	
FT HUNTER LIGGETT	CA	166000	
FT INDIANTOWN GAP	PA	17520	
FT IRWIN	CA	640000	
FT LEWIS	WA	640000	
FT MCCOY	WI	53777	
FT MCPHERSON	GA	487	
FT MEADE	MD	487	
FT ORD	CA	26000	
FT PICKETT	VA	45000	
FT POLK	LA	45000	
FT RILEY	KS	100369	
FT SHERIDAN	IL	712	
FT STEWART	GA	279000	
LAKE ALLATOONA REC CTR	GA	279000	
PINON CANYON MANEUVER SITE	CO	244000	
YAKIMA FIRING CTR	WA	244000	

Figure 40. Output for Installation Information.

parameters from each of the three list boxes (Selection within Level, Available Installations, and Available Information). First, the user must choose from the Selection within Level. The Available Installations list box will then be populated with a subset of installations based on the previous selection. Both the Available Installations and Available Information list boxes allow multiple selections and require selections to retrieve information. Multiple noncontiguous selections within one topic area are made by holding the <Ctrl> key down while selecting appropriate choices. Multiple contiguous selections within one topic area are made by holding the <Shift> key down while making the first and last selections. Once selections have been made in the Available Installations and Available Information list boxes, click on the <OK> button to proceed to the output screen.

The Installation Information output screen (Figure 40) has three buttons in common: <Back>, <Copy>, and <Cancel>. The <Back> button returns the user to the previous dialog box, retaining the contents of the Search Level. To change the Search Level, the user must return to the main menu and reselect from the <Installation Info> option, as described earlier in this section. The <Copy> button allows the user to copy selected spreadsheet contents to any wordprocessor or spreadsheet. Select the desired rows of information in the same manner as described above by using the <Ctrl> and <Shift> keys. The <Cancel> button will exit from this window but will not retain any of the information currently chosen.

## Ad Hoc Queries

### *Description of Output Information*

The <Ad Hoc Queries> mechanism (Figure 41) was developed for conducting searches for specialized information. By using this query mechanism, the user can create a customized series of parameters (e.g., installations, species, Federal status, states, etc.) under a single topic area <Species Occurrence>. This allows the user to customize, answer more questions, and perform greater individual output analyses, than could be accomplished from the Canned Queries menu alone. Examples of potential questions include:

1. Which installations have a particular species?
2. What is the state and Federal status of individual species?
3. Which installations reside in a given state?

### *How To Access Information*

Retrieving information from the Ad Hoc Queries mechanism involves three steps. First, the user must develop a query to identify specific parameters, output information, and sorting mechanisms. Second, the user reviews the raw data retrieved from the database to verify applicability to the specialized request. At this stage, the user can either progress to the final stage, or develop a new query that may be more applicable to the users needs. Lastly, the user develops a final summary of the raw data.

**Developing a query.** Ad hoc query information can be accessed through the <Ad Hoc Queries> menu, by clicking on the <Species Occurrence> option (Figure 41). The Species Occurrence Ad Hoc Queries dialog box (Figure 42) will open after a short delay, while retrieving current information from the database. This dialog box represents the selection of specific parameters (i.e., the "where clause" portion of the query). Five list boxes are presented upon initial startup—Level, Organism, Status, Year, and State. To populate the Level Choice, Organism Choice, and Status Choice list boxes with information from the database, the user must select an option from each of the list boxes to the immediate left (Level, Organism, and Status). For example, by selecting Service in the Level list box, a list of Services from the

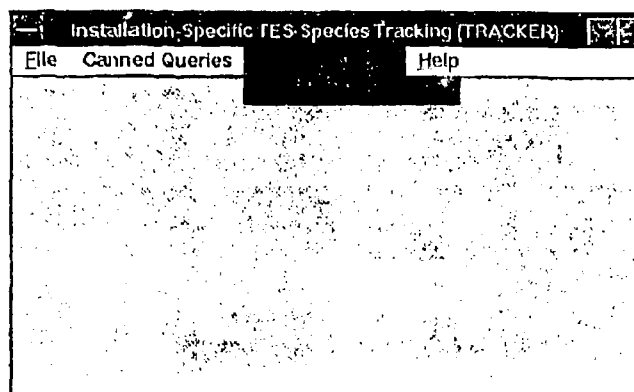
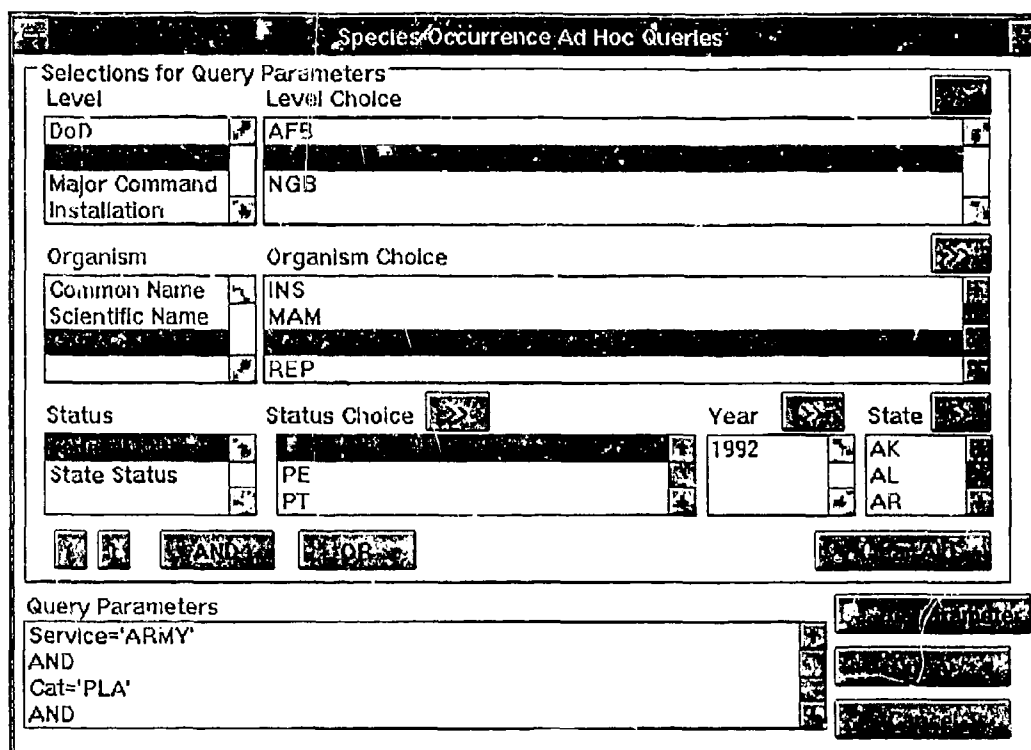


Figure 41. Ad Hoc Queries <Species Occurrence> Menu.





The dialog box is titled "Species Occurrence Ad Hoc Queries". It contains several sections for user input:

- Selections for Query Parameters:**
  - Level:** A list box with "DoD" selected and a "Level Choice" button.
  - Major Command:** A list box with "NGB" selected.
  - Installation:** A list box.
  - Organism:** A list box with "INS" selected and an "Organism Choice" button.
  - Scientific Name:** A list box with "MAM" selected.
  - REP:** A list box with "REP" selected.
  - Status:** A list box with "PE" selected and a "Status Choice" button.
  - State Status:** A list box with "PT" selected.
  - Year:** A text box containing "1992".
  - State:** A list box with "AK" selected.
- Query Parameters:**
  - A text box containing "Service='ARMY'".
  - A text box containing "AND".
  - A text box containing "Cat='PLA'".
  - A text box containing "AND".

At the bottom, there are buttons for "<Clear All>", "<OK>", and "<Cancel>".

Figure 42. Species Occurrence Ad Hoc Query Dialog Box.

database is populated in the Level Choice list box. The other two categories are populated in a similar manner. Input elements in the Query Parameters list box can be selected from five list boxes, including Level Choice, Organism Choice, Status Choice, Year, and State. To clear all current selections in the top five list boxes, click once on the <Clear All> button.

The Query Parameters list box is populated as the user selects various parameters and logical operators. Logical operators are functions that join parameters (e.g., < >, < > >, <AND>, and <OR>). Individual selections from each of the list boxes are made by clicking once on the selection and then clicking on the < > > button, or simply by double clicking on individual selections. Parentheses are used to develop a subset of information that is exclusive from all other parameters. For example, "(Service='ARMY' OR Service='NGB')" obtains information on installations that are either Army or National Guard Bureau. The <AND> operator acts as an intersection operation (e.g., "(Service='ARMY' OR Service='NGB') AND Fed\_stat='E'"). This statement obtains information that fulfills two parameters—installations within the Army or National Guard Bureau and all species having a Federal status of Endangered. The <OR> operator acts as a union operator (i.e., the information exists within either parameter). A graphical depiction of this concept is shown in Appendix D.

For further information on structured query language (SQL), see the user's manual for the database engine or a reference manual on SQL language. To include any one of the logical operators in the Query Parameters list box, simply click once on the appropriate < ( >, < ) >, <AND>, or <OR> button. If mistakes are made while developing Query Parameters, individual selections can be removed by using the <Delete Parameter> button, located to the right of the Query Parameters list box. Highlight the parameter you want removed and click once on the <Delete Parameter> button. After Query Parameters have been developed, click once on the <Query> button, located in the lower right-hand corner of the dialog box, to continue the query development process. The <Cancel> button, located in the lower right-hand corner of the dialog box, exits the user from this window but does not retain any of the information currently chosen.

The Output Selections dialog box (Figure 43) was developed so the user can select the desired output information (i.e., the "select" portion of the query). The available output information topic areas include DoD, Service, Major Command, Installation, Common Name, Scientific Name, Category, Federal Status, State Status, Year, and

State. Multiple noncontiguous selections within one topic area are made by holding down the <Ctrl> key while selecting appropriate choices. Multiple contiguous selections within one topic area are made by holding down the <Shift> key while making the first and last selections.

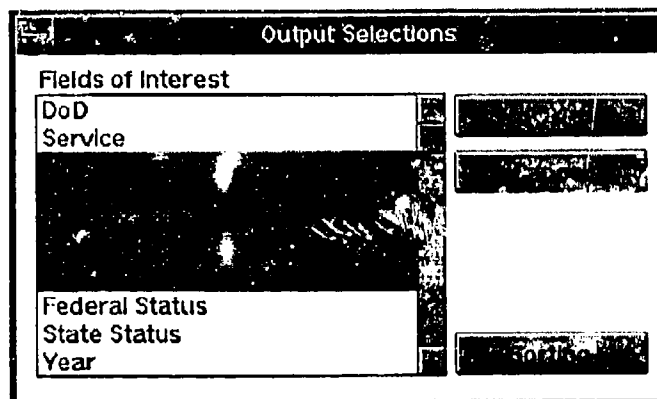


Figure 43. Output Information Section Dialog Box.

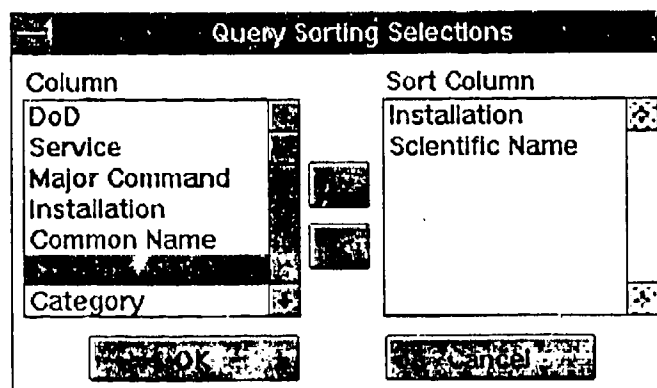


Figure 44. Sorting Selection Dialog Box.

The <Sorting> button allows the user to select the desired sort order for the information. Once the button has been clicked, the Query Sorting Selections dialog box (Figure 44) will open. Available sorting elements for output information topic areas are similar to those listed above. To select sorting elements, the user must choose a single selection in the Column List box and click once on the < >>> button. The selection will then appear in the

**Raw Data for Species Occurrence Query**

**Query Parameters**

```
SELECT DISTINCT t_inst_info.macom, t_inst_info.installation, tax1.com_name,
tax1.sci_name, tax1.cat from t_inst_info, tax1, t_spp_occur where
t_inst_info.incode=t_spp_occur.incode and t_spp_occur.sppcode=tax1.sppcode and
t_spp_occur.st=t_inst_info.st and Service='ARMY' AND Cat='PLA' AND Fed_Stat='E'
order by t_inst_info.installation, tax1.sci_name
```

**Raw Data**

Major Command	Installation	Common Name	Scientific Name
FORSCOM	FT STEWART	CANEY'S DROPWORT	ONIPOLIS CANE11
FORSCOM	FT STEWART	SWEET PITCHER PLANT	SARRACENIA FLUBRA
FORSCOM	FT STEWART	CHAFFSEED	SCHWALBEA AMERICANA
FORSCOM	FT STEWART	COOLEY'S MEADOW RUE	THALICTRUM COOLEYI
MIMC	ML OCEAN TERMINAL SUNNY POINT	ROUGH-LEAVED LOOSESTRIPE	LYSIMACHIA SPERULAFOLIA
USARPAC	POHAKULOA TRAINING AREA	NARROW-LEAVED HAPLOSTACHYS	HAPLOSTACHYS HAPLOSTACHYA AND
USARPAC	POHAKULOA TRAINING AREA	KIOELE	HEDYOTIS CORIACEA
USARPAC	POHAKULOA TRAINING AREA	NONE	LIPDCHAETA VENCEA
USARPAC	POHAKULOA TRAINING AREA	KAUAI CATCHFLY	SILENE LANCEOLATA
USARPAC	POHAKULOA TRAINING AREA	RED HAWAIIAN MINT	STENOGYNE ANGUSTIFOLIA ANGUSTIF
AMC	WHITE SANDS MISSILE RANGE	TODSEN'S PENNYROYAL	HEDEOMA TODSENII

Total Row #: 32

Figure 45. Raw data output for Ad Hoc Query Mechanism.

**Sort Column.** Additional selections can be made in a similar manner, but remember that the order of selections will also be the sorting order for the information. To remove selections from the Sort Column list box, simply highlight the undesired selection and click once on the <<> button. However, selections in the Sort Column list box must be a subset or match of the output information topic areas selected in the Output Selections dialog box (Figure 43). Once the output information and sorting elements have been selected, the query is ready to be executed. The user can proceed to view the raw data by clicking on the <OK> button in the Output Selections dialog box. The <Cancel> button will exit the user from this window, without saving any of the current information, and return the user to the Species Occurrence Ad Hoc Queries dialog box.

**Reviewing raw data.** The Raw Data for Species Occurrence Query dialog box (Figure 45) presents the user with raw data from the query developed in the last few steps. The three main components to this window are Query Parameters, Raw Data, and Total Row Number (#). The Query Parameters edit box contains the completed query that was used to obtain the raw data. Columns in the Raw Data spreadsheet option represent selections made from the Output Selections dialog box (Figure 43). The Total Row # indicates the number of rows, or records, that satisfy the chosen parameters. Two explanations may be given if the spreadsheet does not contain any records. First, the query may have too many parameters or is too specific to retrieve matches per the request. Second, there may be an error in the query structure. In

either case, the user should first check the query within the Query Parameters edit box and make necessary modifications in the Ad Hoc Queries dialog box. Once the desired information has been viewed, the user may proceed to the final step of developing summaries by clicking on the <Count> button.

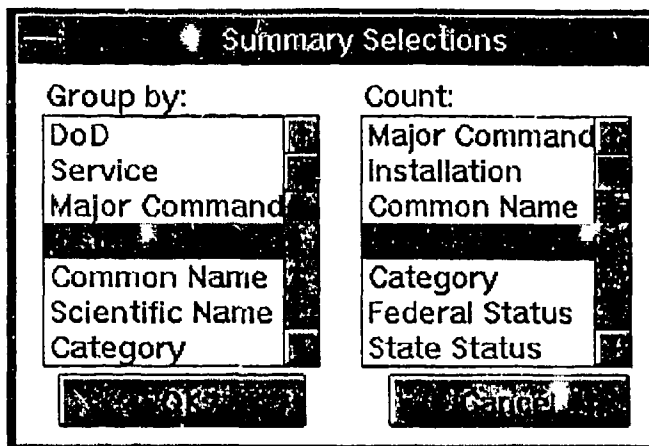


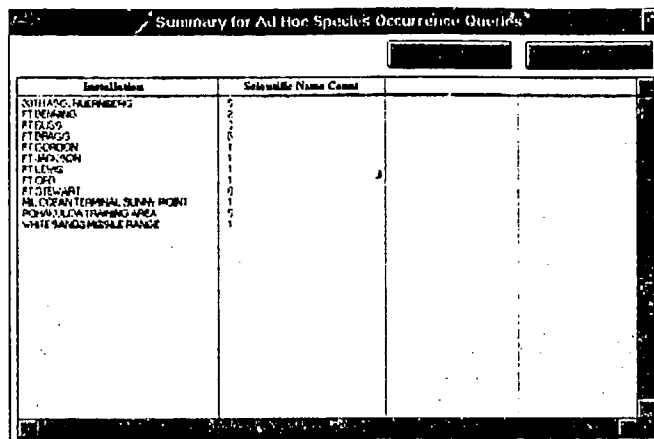
Figure 46. Summary Selection Dialog Box.

Two copy buttons are available in this dialog box, <Copy Query> and <Copy Raw Data>. The <Copy Query> button allows the user to save queries in a database manager for future use. Highlight the query and then click on the <Copy Query> button to copy information to a wordprocessor. The <Copy Raw Data> button allows the user to copy selected spreadsheet contents to any wordprocessor or spreadsheet. Select the desired rows of information in the same manner as described above by using the <Ctrl> and <Shift> keys. To modify existing parameters, the user must click on the <Cancel> button and return to the Species Occurrence Ad Hoc Queries dialog box.

**Final summary on raw data.** The <Count> button allows the user to run simple counts on a variety of information. When the Summary Selections dialog box (Figure 46) opens, two list boxes appear, Group By and Count. The Group By list box allows the user to select output columns for the final data set. Selected columns must match, or be a subset of, the original raw data columns. Multiple selections are allowed. The Count list box, on the other hand, does not allow multiple selections, and the user can choose only one parameter at a time. Once selections have been made from both list boxes, the user may proceed by clicking once on the <OK> button. To disregard choices made in the Summary Selections dialog box, simply click once on the <Cancel> button. This action will return the user to the Raw Data for Species Occurrence Query dialog box (Figure 45).

The Summary for Ad Hoc Species Occurrence Queries window (Figure 47) presents the summarized information in a spreadsheet format. Two buttons, <Copy> and <Close>, are presented in this dialog box. The <Copy> button allows the user to copy selected spreadsheet contents to any wordprocessor or spreadsheet. Select the desired rows of information in the same manner as described above by using the <Ctrl> and <Shift> keys. Three explanations may be given if the spreadsheet does not contain any records. First, the query may not be correct. Second, the columns

selected in the Group By list box of the Summary Selections dialog box may not match or be a subset of the original raw data columns. Lastly, the selected counting element from the Count list box of the Summary Selections dialog box may not be valid. Retracing the query development process, as stated throughout this section, will help in finding the problem. In any case, the <Close> button will exit the user from the current window and return them to the Raw Data for Species Occurrence Query dialog box. At this point, the query can be visually checked for problems, or new queries developed.



Installation	Sealable Name Count
SOUTH COAST HARBOR	2
FT. HARRIS	2
FT. LEO	2
FT. BRAGG	1
FT. CORDON	1
FT. JACOSON	1
FT. LEWIS	1
FT. OCH	1
FT. OCHART	1
MIL COAST TERMINAL SUNNY POINT	1
POWELLVILLE TAPPING AREA	2
WHITE SANDS MISSILE RANGE	1

Figure 47. Spreadsheet output for Species Occurrence Ad Hoc Query Mechanism.

## Help Menu - About Box

The About Box (Figure 48) provides information similar to that in the introductory dialog box (Figure 2), except for the names of developers and contributors. This dialog box can be accessed through the <Help> selection of the main menu by clicking on the <About...> option. Proceed by clicking on the <OK> button, located in the lower righthand corner.



Figure 48. About Box for TRACKER's Query and Summary Component.

## 6 Using the Automated Input Forms Component

The Automated Input Forms component is designed to support the Query and Summary component by providing a direct mechanism for data entry into a database. A series of dialog boxes prompt the user to enter specific details on <Species Occurrence>, <Funding>, <Mission Constraints>, and <Restricted Acres>. Associated forms for these topic areas are accessed through the <Data Entry> menu and provide an initial series of automated data checking and validation steps. Information is then entered into a temporary TES species database, where it can be used by the TRACKER Query and Summary component. In addition to annual information on existing installations and TES Species, forms for incorporating <New Installations> or <New Species> (Figure 49) are also provided. Menu selections <File> (<Exit>), <Data Entry>, <New Information>, and <Help> (<About...>) are discussed below.

### File Menu - Exiting the Program

The <Exit> command (Figure 50), under <File>, closes and ends the program.

### Data Entry

Input forms on topic areas <Species Occurrence>, <Funding>, <Mission Constraints>, and <Restricted Acres> can be accessed through the <Data Entry> menu (Figure 51). Each topic area has

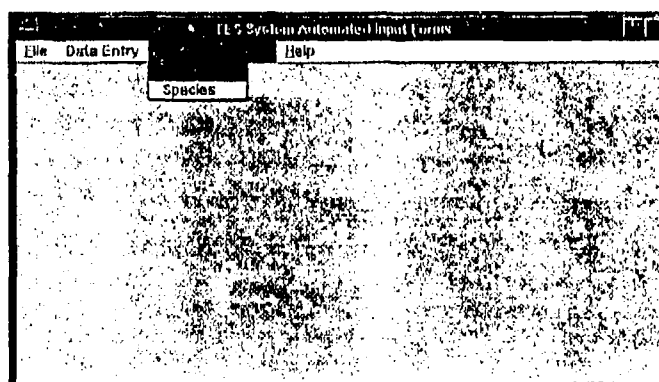


Figure 49. New Information <Installation> and <Species> Menu.

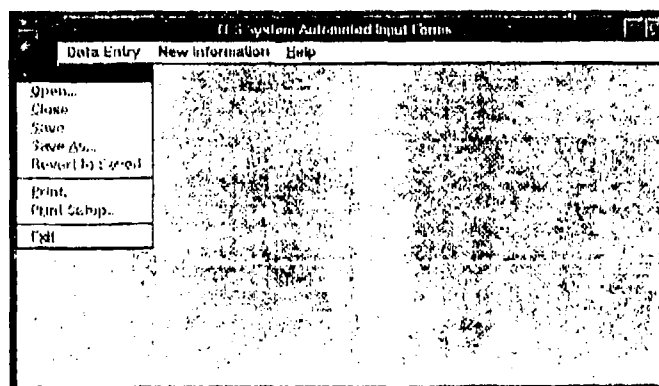


Figure 50. <Exit> Menu.

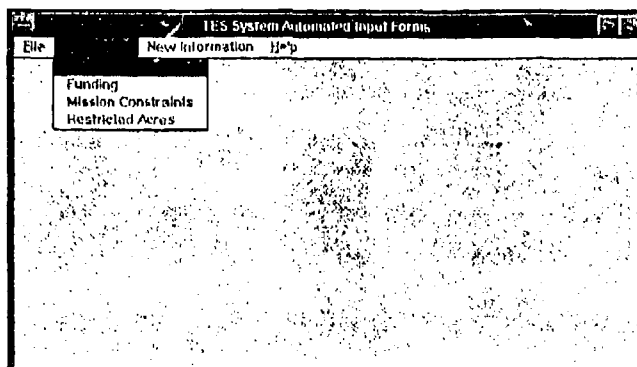


Figure 51. Data Entry (<Species Occurrence>, <Funding>, <Mission Constraints>, <Restricted Acres>) Menu.

Figure 52) prompts the user for five distinct pieces of information, Installation, Species Scientific Name, Current Year, Species Occurrence, and Type of Occurrence. The Installation list box displays a listing of installations in the database. The Species list box displays a listing of scientific names in the database. The Current Year list box serves as a year date stamp for the information. The Species Occurrence list box contains two choices, Known or Suspected, regarding individual TES species and their occurrence on the installation. The Type of Occurrence list box refers to the species residency status (Seasonal, Permanent, and Accidental Tourist) on the installation. Definitions for the individual list box choices are defined in Appendix F.

**How to enter information.** The Species Occurrence input form (Figure 52) can be opened through the <Data Entry> menu by clicking on the <Species Occurrence> option (Figure 51). Selections can then be made from each list box—Installation, Species Scientific Name, Current Year, Species Occurrence, and Type of Occurrence. Once a specific species has been selected from the Species Scientific Name list box,

Figure 52. Species Occurrence Input Form.

a distinct input form but can handle only one installation and one species at a time. Therefore, users may need to fill out each form several times and are encouraged to enter information in all input form fields.

### Species Occurrence

**Information requested.** The Species Occurrence input form (Figure

the common name will automatically appear in the Common Name list box. However, users should check both the scientific and common name for accuracy. If an installation or species is not available in the current list box, the user should refer to the New Information section of this chapter for adding new occurrences.

Two buttons—<Save> and <Cancel>—are available on the Species

Occurrence input form. After the necessary information has been entered, click on the <Save> button to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53) and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information is not correct, or if changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will then be returned to the Species Occurrence dialog box, without committing any of the new information. The user can reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

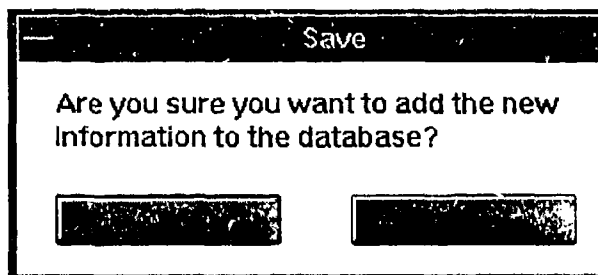


Figure 53. Save Verification Dialog Box.

### Funding

**Information requested.** The Funding input form (Figure 54) prompts the user for six distinct pieces of information—Installation Name, Scientific Name, Previous Year's Funding, Current Year's Funding, Next Year's Funding, and Current Year. The Installation list box displays a listing of installations in the database. The Species list box displays a listing of scientific names in the database. The Previous Year's Funding, Current Year's Funding, and Next Year's Funding list boxes prompt the user to enter the total yearly funding amount. The Current Year list box serves as a date stamp for the information. Definitions for the individual list box choices are defined in Appendix F.

**How to enter Information.** The Funding input form (Figure 54) can be opened through the <Data Entry> menu, by clicking on the <Funding> option (Figure 51). Selections from each list box, Installation Name, Scientific Name, and Current Year, can then be made. Once a specific species has been selected from the Species Scientific Name list box, the common name will automatically appear in the Common Name list box. However, users should check both the scientific and common name

Figure 54. Funding Input Form.





**How to enter information.** The Mission Constraints input form (Figure 55) can be opened through the <Data Entry> menu, by clicking on the <Mission Constraints> option (Figure 51). Selections can then be made from each list box—Installation, Species Scientific Name, Organization, Current Year, Training Mission Constraints, Non-Training Mission Constraints, and Overall Mission Constraints. Once a specific species has been selected from the Species Scientific Name list box, the common name will automatically appear in the Common Name list box. However, users should check both the scientific and common name for accuracy. If an installation or species is not available in the current list box, the user should refer to the New Information section of this chapter for adding new occurrences.

Figure 56. Mission Constraints (DPT) Input Form.

Two buttons—<Save> and <Cancel>—are available on the Mission Constraints input form. Once the necessary information has been entered, click on the <Save> button to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53), and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information is not correct, or if changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will then be returned to the Mission Constraints dialog box, without committing any of the new information. The user can reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

### **Restricted Acres**

**Information requested.** The Restricted Acres input form (Figure 57) prompts the user for four distinct pieces of information—Installation Name, Scientific Name, Restricted Acres, and Current Year. The Installation list box displays a listing of installations in the database. The Species list box displays a listing of scientific names in the database. The Restricted Acres list box prompts the user to enter the total restricted acreage per year. The Current Year list box serves as a date stamp

Figure 57. Restricted Acres Input Form.

for the information. Definitions for the individual list box choices are defined in Appendix F.

**How to enter information.** The Restricted Acres input form (Figure 57) can be opened through the <Data Entry> menu, by clicking on the <Restricted Acres> option (Figure 51). Selections can then be made from each list box—Installation Name, Scientific Name, and Current Year. Once a specific species has been selected from the Species Scientific Name list box, the common name will

automatically appear in the Common Name list box. However, users should verify the species by checking both the scientific and common name. If an installation or species is not available in the current list box, the user should refer to the New Information section of this chapter for adding new occurrences. The Restricted Acres list box prompts the user to enter the total restricted acreage per year to the nearest whole acre.

Two buttons—<Save> and <Cancel>—are available on the Restricted Acres input form. Once the necessary information has been entered, click on the <Save> button to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53) and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information is not correct, or if changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will then be returned to the Restricted Acres dialog box, without committing any of the new information. The user can reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

## New Information

The following two sections describe the process of adding a new installation or species. If the installation or species of interest is available in the current list box, skip the following sections. In some instances, a particular installation or species within the Species Data Entry input form (Figures 52, 54, 55, 56, and 57) may not

be listed. The appropriate installation or species of interest must then be added by using the <Installation> or <Species> option under the <New Information> menu (Figure 49).

### ***Adding a New Installation***

**Information requested.** The New Installation dialog box (Figure 58) prompts the user for seven pieces of information: Installation Name, Service, Major Command, Total Acreage, County(ies), Surrounding County(ies), and Current Year. Both the Service and Major Command list boxes display a listing of organizations in the TES species database. The County(ies) field refers to the county(ies) in which the installation is located. The Surrounding County(ies) field refers to counties immediately adjacent to the installation county(ies). The Total Acreage field prompts the user for the total number of acres on the installation. The Current Year list box serves as a date stamp for the information.

**How to enter information.** Once the user has confirmed that their particular installation does not exist in the database, it should be added. Proceed by selecting the <Installation> option, under the New Information menu (Figure 49). A dialog box will prompt the user for the Installation Name, Service, Major Command, Total Acreage, County(ies), Surrounding County(ies), and Current Year. The minimum information necessary for entering a new installation is the Installation Name, Service, Major Command, and Current Year. However, enter all information if available. Installation Name, Total Acreage, County(ies), and Surrounding County(ies) fields are edit boxes, in which the user must manually enter the information by using the keyboard. To select a certain field, place the mouse cursor in the field and click once. With a blinking carat in the active field, type in the appropriate information in all capital letters. The Service, Major Command, and Current Year fields are drop down lists, where the user selects choices from an established list. However, new responses can be entered if not offered in the drop down list.

Two buttons—<Save> and <Cancel>—are available on the New Installation input form. Once the necessary information has been entered, click on the <Save> button

Figure 58. New Installation Input Form.

to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53), and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information is not correct, or if changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will then be returned to the New Installation dialog box, without committing any of the new information. The user can then reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

### ***Adding a New Species***

**Information requested.** The New TES Species dialog box (Figure 59) prompts the user for 12 pieces of information—Kingdom, Phylum, Class, Order, Family, Genus, Species, Subspecies, Variety, Common Name, Category, and Current Year. The first 10 fields request information about the species. The Category list box displays taxonomic categories and the Current Year list box serves as a date stamp for the information.

**How to enter information.** Once the user has confirmed that a particular species does not currently exist in the database, it should be added. Proceed by selecting the <Species> option, under the <New Information> menu (Figure 49). A dialog box will then prompt the user for information on the Kingdom, Phylum, Class, Order, Family, Genus, Species, Subspecies, Variety, Common Name, Category and Current Year. The minimum information necessary for entering a new species includes the Genus, Species, and Current Year. However, enter all information if available. Ten of these fields—Kingdom, Phylum, Class, Order, Family, Genus, Species, Subspecies, Variety, and Common Name

—are edit fields in which the keyboard must be used to enter information. To select a certain field, place the mouse cursor in the field and click once. With a blinking carat in the active field, type in the appropriate information in all capital letters. The last two fields, Category and Current Year, are list boxes that users can select from.

Two buttons—<Save> and <Cancel>—are available on the New

**New TES Species**

Kingdom:

Phylum:

Class:

Family:

Order:

Genus:

Species:

Subspecies:

Variety:

Common Name:

Category: 

AMP
DIR
CLA
GRU
INS

Current Year: 

1995
1996
1997
1998
1999
2000

\*In order to ensure the proper entry of a new species into the database, the Species, and Current Year options must be populated.\*

**Figure 59. New Species Input Form.**

Two buttons—<Save> and <Cancel>—are available on the New Species input form. Once the necessary information has been entered, click on the <Save> button to begin committing the information to the database. This button will then prompt the Save dialog box (Figure 53) and ask for verification. If the information is correct, select <OK> to finish the commit process. If the information is not correct, or if changes need to be made, simply select the <Cancel> button on the Save dialog box. The user will then be returned to the New Species dialog box, without committing any of the new information. The user can then reenter the appropriate information, or hit the <Cancel> button to exit this window, without retaining the current information.

### Help Menu - About Box

The About Box (Figure 60) provides information similar to that given in the introduction dialog box (Figure 3), except for names of developers and contributors. This dialog box can be accessed through the <Help> selection of the main menu by clicking on the <About...> option. Proceed by clicking on the <OK> button, located in the lower righthand corner.

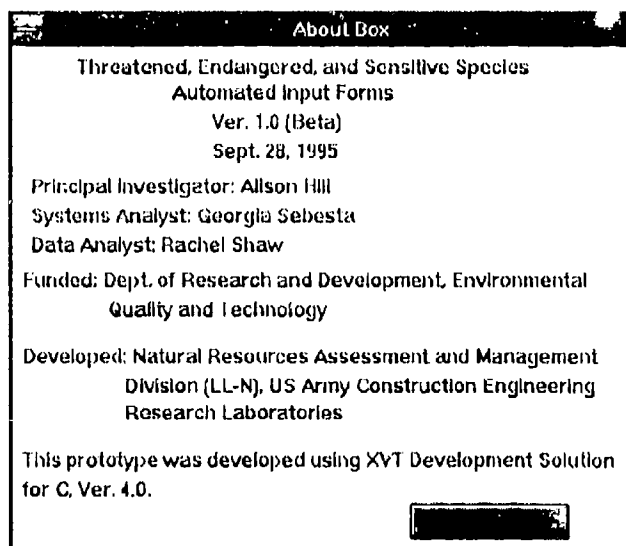


Figure 60. About Box for Automated Input Forms.

## 7 Database

This chapter discusses information about the centralized database that is distributed and used by the TRACKER component of TESSAIMS. The information that follows is written primarily for database managers, programmers, and system analysts. Information can be divided into five distinct topic areas, two of which include Source and Limitations. Source includes where the information came from and the type of information obtained. Limitations address the availability, validity, and accuracy of the information. The database, on the other hand, is divided into three topic areas: (1) how the database is organized, (2) descriptions of the database elements, and (3) data definitions. Future information needs for the military and TES species will also be addressed.

### Data Source

In the summer of 1992, a survey was sent to over 170 Army installations, covering a broad spectrum of topic areas. From survey responses, over 750 TES and other related species were entered into a TES species database. Information entered into the database came directly from military installations, including the environmental office, military trainers, and the JAG office. The initial survey covered a much broader spectrum of topic areas than is currently included in the TRACKER tool. Additional topic areas included legal issues, general knowledge management techniques, inventory, and monitoring.

### Data and Database Limitations

Information in the database does have limitations. First, since the data is considered current as of July 1992, much of the information is already outdated. In addition, obtaining, compiling, and verifying information is also

very time consuming and costly. Second, the information is limited in scope to the previously mentioned topic areas: <Species Occurrence>, <Funding>, <Restrictions/Constraints>, and <Installation Info>. These topic areas were prioritized and deemed most important from the original survey. However, the knowledge base varies greatly between installations depending on funding and staff turnover. Therefore, the consistency of information is directly impacted. Lastly, with over 170 installations and 750 TES species currently in the database, many problems exist. The amount of information is enormous and the effort to manage this information is already overwhelming. These problems will increase as additional installations and species are added to the database.

## Database Organization

Key decisions were made early in the database development process. First, the database needed to be relational, to allow database managers to store the maximum amount of information with minimal duplication. Relational databases consist of a series of tables, with many records, that are linked by primary keys or unique identifiers. Queries use these primary keys to access multiple tables, whereas unique identifiers are used primarily for data management purposes but may appear in some output summaries. Primary keys within TRACKER's database tables are the species name codes (SPPCODE) and the installation name codes (INCODE). The SPPCODE for plants and animals consists of the first two letters of genus and the first two letters of the specific epithet (e.g., AICA for *Aimophila carpalis* [Rufous-winged sparrow]). If duplicate codes exist, ascending numbers, starting with 1, are added to the end of the SPPCODE (e.g., AICA1 for *Aimophila cassinii* [Cassin's sparrow]). The INCODE consists of the first three letters of the installation proper name (e.g., HOO for Fort Hood). If duplicate codes exist, the next unique letter to the immediate right of the installation's proper name should be used until a unique identifier is found.

A second key point was that of organizing the information in the database. Organization can greatly speed up access time for TRACKER by reducing the number of tables being accessed during the retrieval process. The entire TES species database (Appendix A) contains three distinct sets of information, linked by primary keys, that support each of the 'TESSAIMS'



applications. Most table names begin with a unique letter that identifies the type of information within the table. For example, S\_ labels are used for species-specific information tables supporting SSBI; E\_ labels are for tables supporting BioTES; and T\_ labels are for installation-specific information tables supporting TRACKER. TAXONOMY and some of the other database management tables are the only tables that do not use this naming convention. TAXONOMY contains a general taxonomic breakdown for species used by TRACKER and SSBI. Individual tables and fields are further defined in the **Database Tables and Column Names**, and **Future Information Needs** sections of this chapter.

### **Database Tables and Column Names**

The TRACKER tool uses 11 tables from the TES species database for the Query and Summary component (Appendix E). Seven T\_ tables contain installation-specific information, T\_DEH\_MISS\_C, T\_DPT\_MIS\_C, T\_FUNDING, T\_INST\_CONT, T\_INST\_INFO, T\_RES\_ACRES, and T\_SPP\_OCCUR. The TAXONOMY table contains taxonomic information on all TES species within the entire database. The remaining three tables, N\_TRAIN\_MISS, O\_MISSION\_TR, and TRAIN\_M\_TR, are information management tables used for programming. Fields not currently populated are italicized.

### **Data Definitions**

The TRACKER tool uses six tables in a temporary database for the Automated Input Forms component (Appendix F). Information requested includes New Installations, New TES Species, Species Occurrence, Funding, Mission Constraints, and Restricted Acres. Definitions for each general topic area, data field definitions, and valid responses are also presented in Appendix F.

## **Future Information Needs**

Information currently in the database is minimal when describing baseline conditions of TES species Army-wide. Therefore, future work should concentrate on: (1) improving information quality, (2) continuing to define and refine user needs, (3) validating installation responses, and (4) expanding the scope of the information.

## 8 Application Development

Developers searched for tools to meet government standards that were readily available, and satisfied the users' needs. Government standards currently require the use of database engines that recognize the SQL and operate in the UNIX and MS-DOS operating systems. Developers also wanted tools that would be compatible with application developments already underway. In the initial search for available off-the-shelf development tools, these standards helped guide decisions. The rapid development tool selected, XVT Development Solution for C by XVT Software, Inc., provided opportunities for the development of multiple operating systems and platforms and the ability to output the program code in C language. C language makes it easy for developers to add customized codes for compatibility with other applications. Development of TESSAIMS took place in the MS-DOS operating system on the Window GUI, and can be easily recompiled for UNIX systems. To eventually reach a variety of database engines, open database connectivity (ODBC) compliance was used. All initial development was done using SQLBase by Gupta Technologies, Inc. SQLBase is fairly easy to use, cost effective, and one of the initial databases developed for Windows. Further system requirements are listed in Chapter 3 under **System Requirements** and **Software Requirements**.

## References

- Boice, L.P. and J. Kaiser, "DOD's Conservation Program: Supporting the Military Mission While Protecting a Wealth of National Resources," *22nd Environmental Symposium and Exhibition* (American Defense Preparedness Association, March 1996, pp 489-494).
- Sebesta, G., *Overview of Development on the Threatened, Endangered, and Sensitive (TES) Species Automated Information Management System (TESSAIMS)* (Dept. of Natural Resources and Environmental Sciences, University of Illinois, 1995).
- Sebesta, G., and A. Hill, *User's Manual for Biodiversity and Threatened and Endangered Species Expert (BioTES) Tool Version 1.0*, ADP Report 97/21 (USACERL, November 1996).
- Sebesta, G., and A. Hill, *User's Manual for Species-Specific Biological Information (SSBI) Tool Version 1.0*, ADP Report 97/20 (USACERL, November 1996).

## **Appendix A: TES Automated Information Management System Database Schematic**

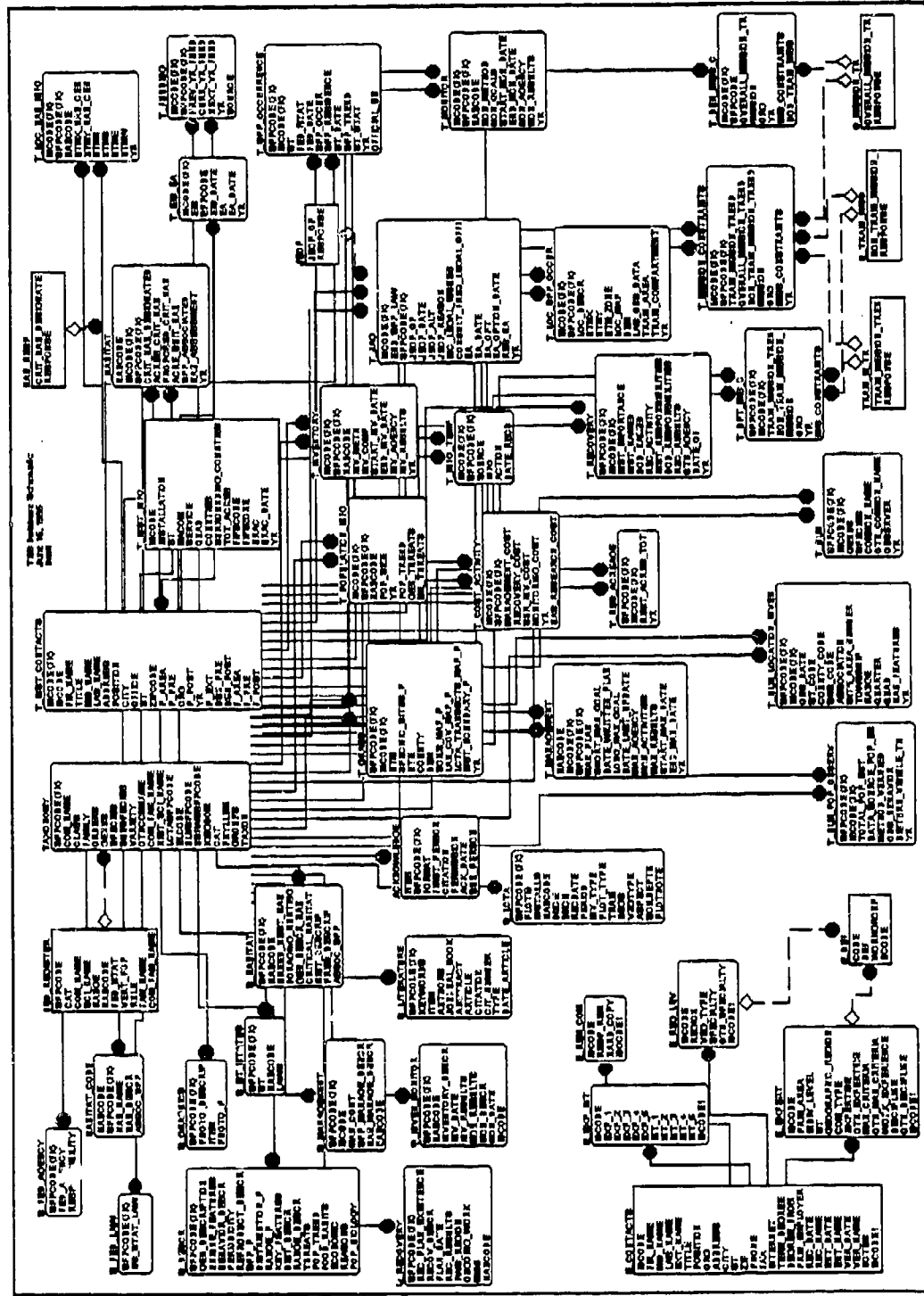


Figure A1. TESSAIMS database schematic.

## **Appendix B: Flow Diagrams for Menu and Queries**

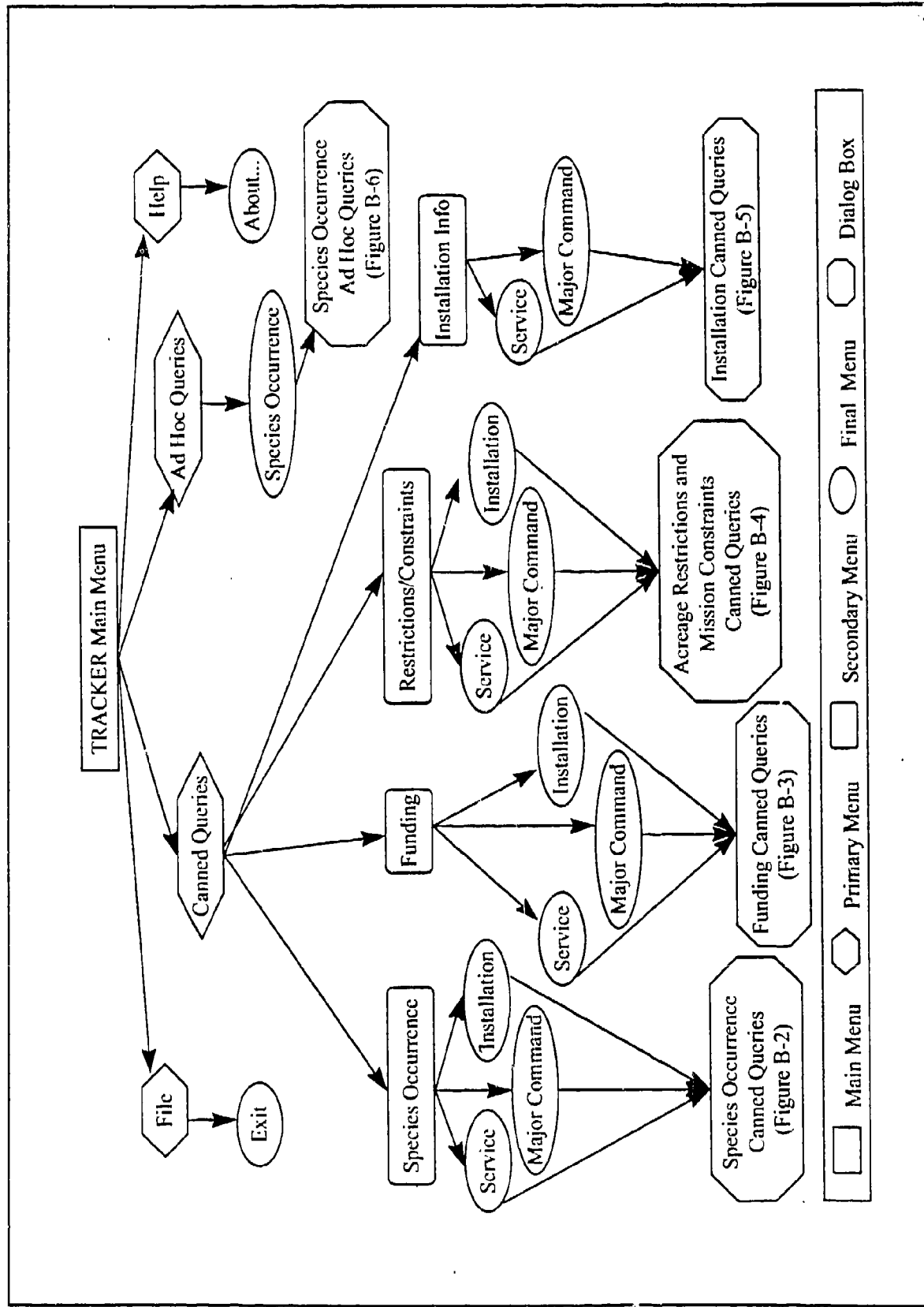


Figure B1. Flow diagram for Main Menu for TRACKER application.



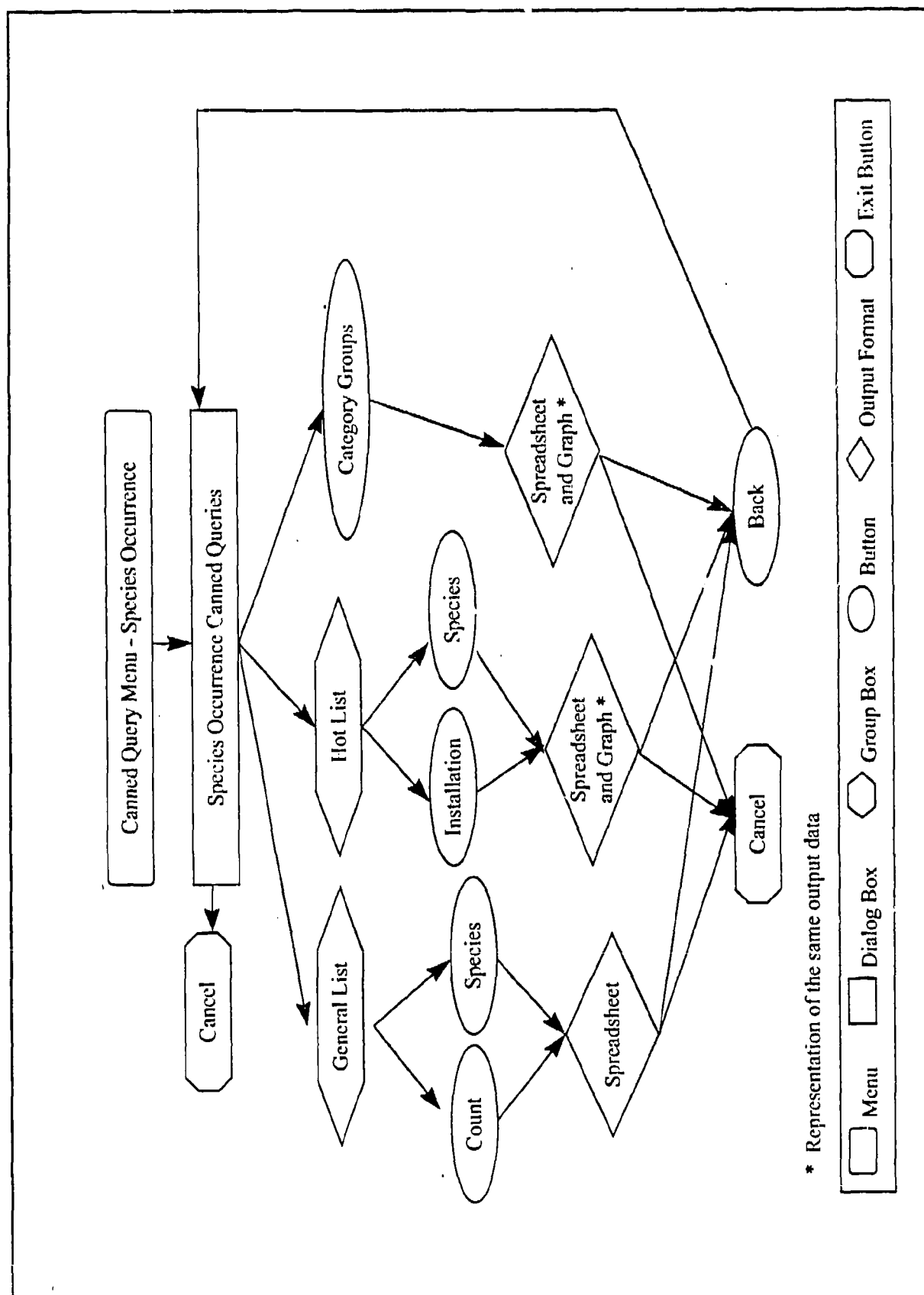


Figure B2. Flow diagram for Species Occurrence Canned Query Mechanism and Output.

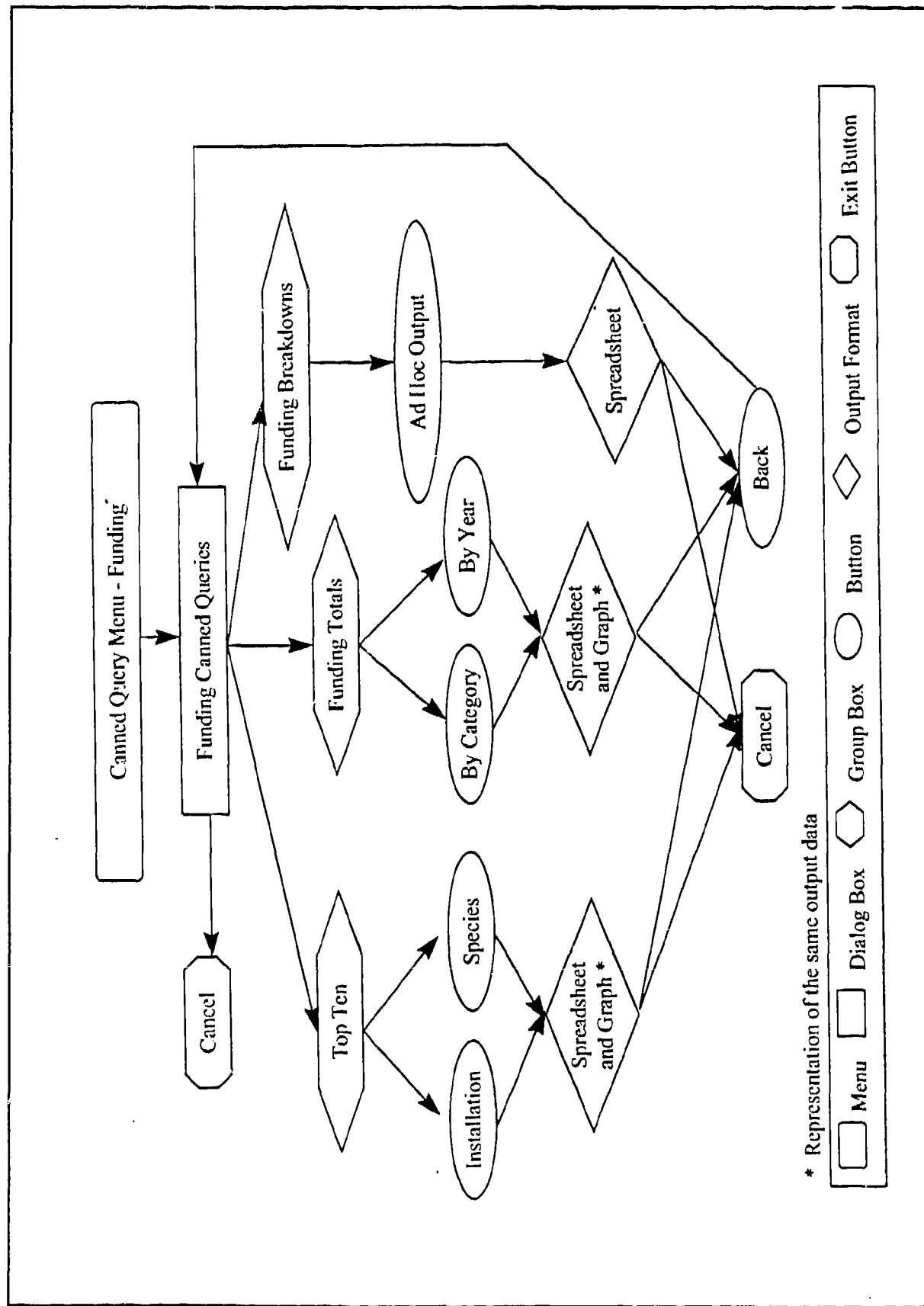


Figure B3. Flow diagram for Funding Canned Query Mechanism and Output.

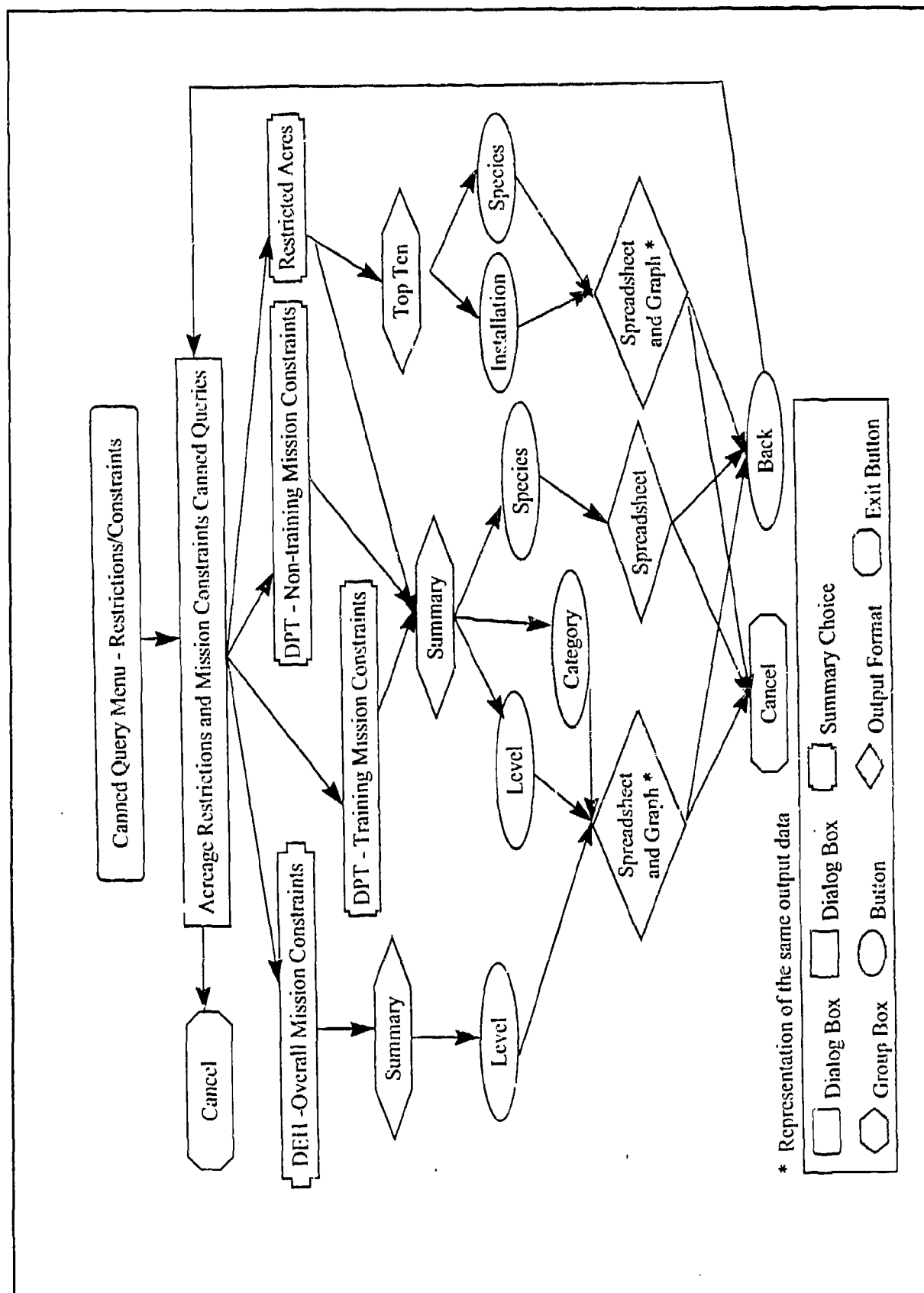


Figure B4. Flow diagram for Restrictions/Constraints Canned Query Mechanism and Output.

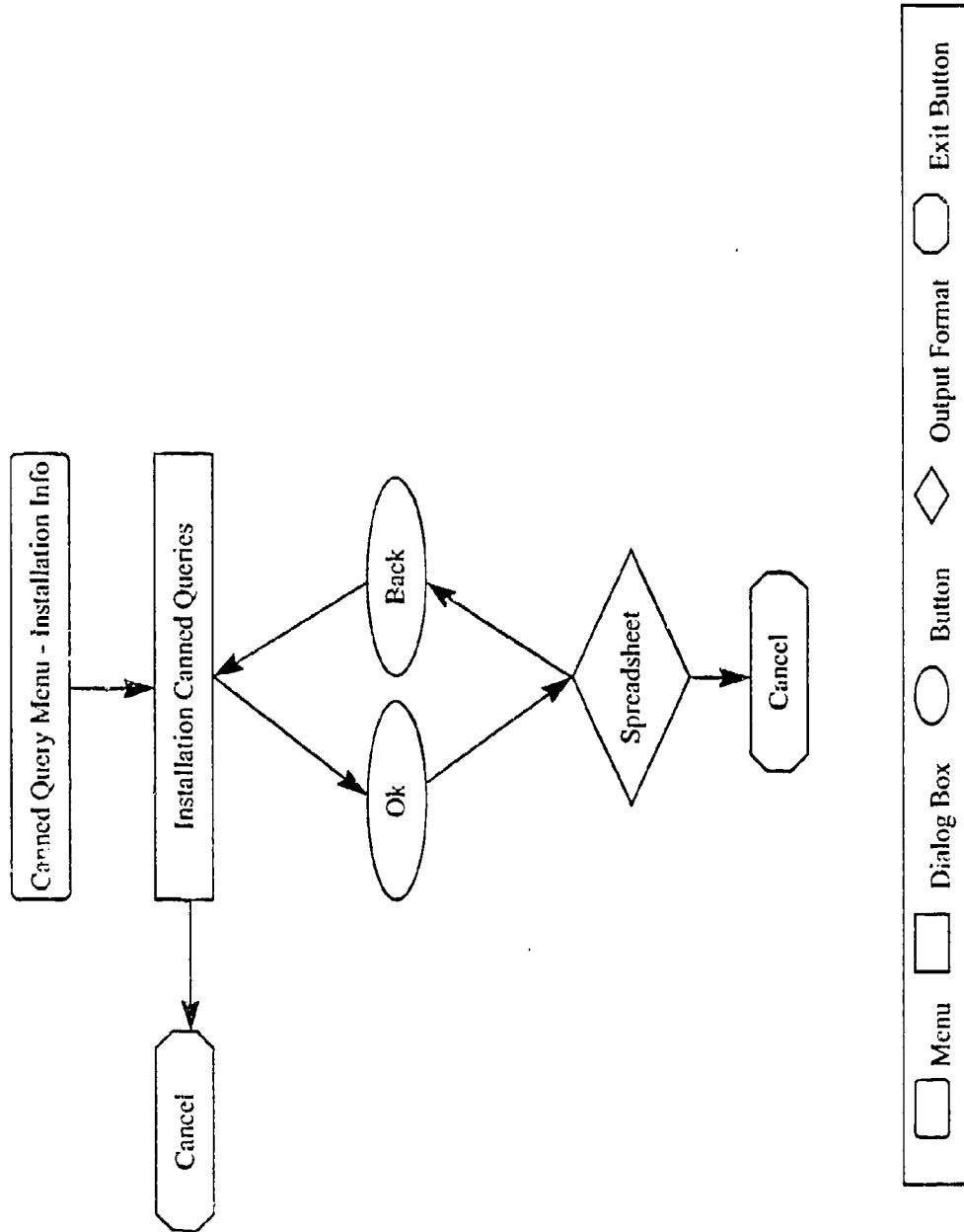


Figure B5. Flow diagram for Installation Info Canned Query Mechanism and Output.

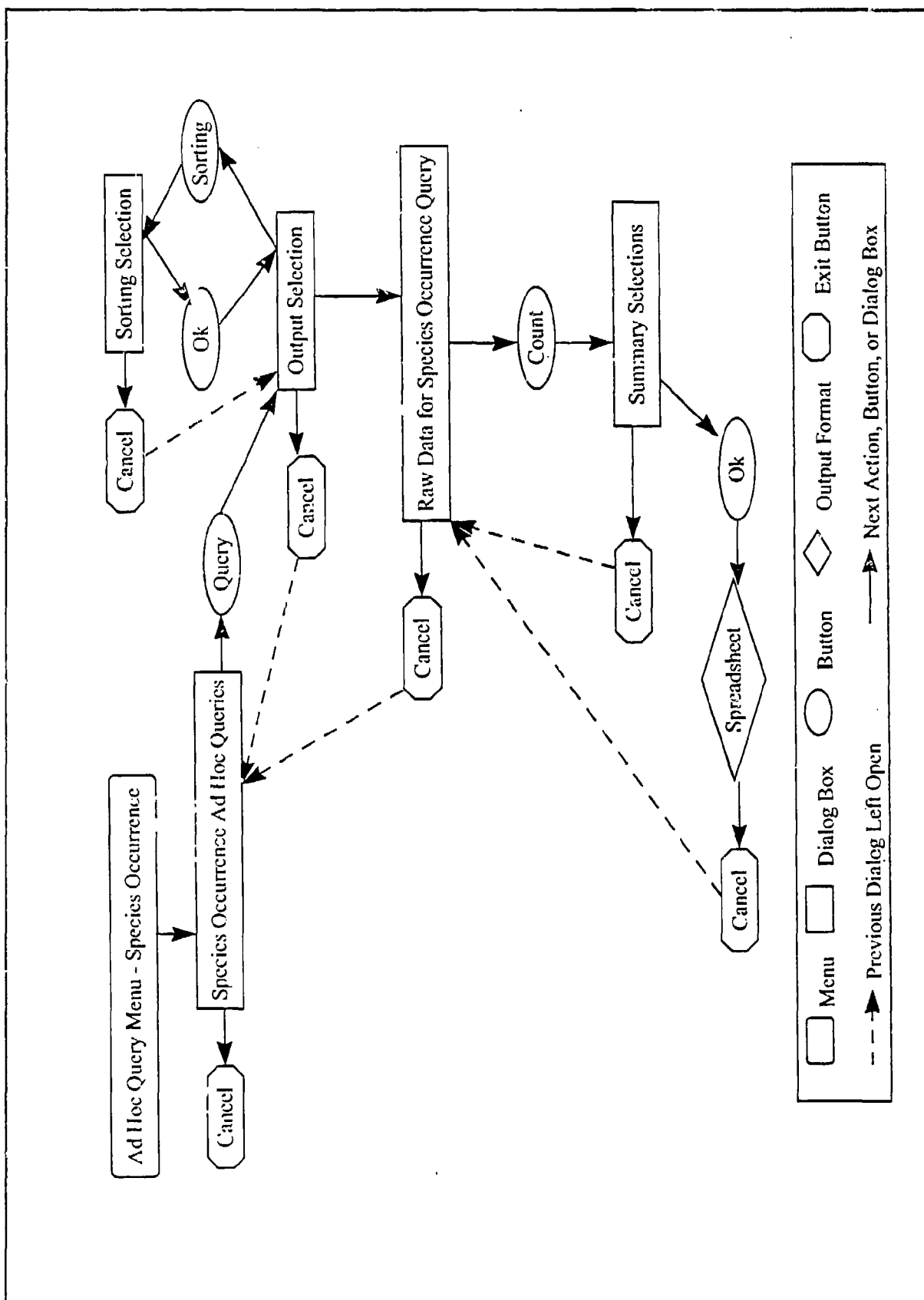


Figure B6. Flow diagram for Ad Hoc Query Mechanism (Species Occurrence) and Output.

## **Appendix C: TRACKER's Canned Query Component Inputs and Outputs**

Topic Area	Summary Button	Inputs (List Box Parameters)	Output Format	General Question
Species Occurrence	General List <Count>	Level of Interest, Federal Status, Year	Spreadsheet	How many distinct TIES species occur on distinct installation?
Species Occurrence	General List <Species>	Level of Interest, Federal Status, Year	Spreadsheet	Which TIES species occur on which installations?
Species Occurrence	Hot List <Installation>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten installations with the most TIES species?
Species Occurrence	Hot List <Species>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten TIES species occurring on the most installations?
Species Occurrence	<Category Group>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the breakdown of TIES species on installations grouped by category?
Funding	Top Ten <Installation>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten installations with TIES species with the most funding?
Funding	Top Ten <Species>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten TIES species occurring on installations with the most funding?
Funding	Funding Totals <By Category>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the funding breakdown for TIES species occurring on installations grouped by category?
Funding	Funding Totals <By Year>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the funding breakdown for TIES species occurring on installations grouped by year?
Funding	Funding Breakdown <All the Output>	Level of Interest, Federal Status, Year, Outputs for Breakdowns, Funding Year Breakdown Sorting	Spreadsheet	This function provides answers to a variety of questions as designed by the user. What are the top ten installations with the most restricted acres caused by TIES species?
Restricted Acres	Top Ten <Installation>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What are the top ten TIES species causing the most restricted acres on installations?
Restricted Acres	Top Ten <Species>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	How many acres are restricted on installations by TIES species?
Restricted Acres	Summary <Level>	Level of Interest, Federal Status, Year	Spreadsheet	How many acres are restricted by distinct TIES species on installations?
Restricted Acres	Summary <Species>	Level of Interest, Federal Status, Year	Spreadsheet	How many acres are restricted on installations by TIES species grouped by category?
Restricted Acres	Summary <Category>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the trend in overall mission constraints by all TIES species according to the DEIT on installations?
DEIT - Overall Mission Constraints	Summary <Level>	Level of Interest, Year	Spreadsheet and Graph	What is the trend in training mission constraints by all TIES species according to the DPT on installations?
DPT - Training Mission Constraints	Summary <Level>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the trend in training mission constraints by distinct TIES species according to the DPT on installations?
DPT - Training Mission Constraints	Summary <Species>	Level of Interest, Federal Status, Year	Spreadsheet	What is the trend in training mission constraints by all TIES species according to the DPT on installations grouped by category?
DPT - Training Mission Constraints	Summary <Category>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the trend in non-training mission constraints by all TIES species according to the DPT on installations?
DPT - Non-training Mission Constraints	Summary <Level>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	What is the trend in non-training mission constraints by distinct TIES species according to the DPT on installations?
DPT - Non-training Mission Constraints	Summary <Species>	Level of Interest, Federal Status, Year	Spreadsheet	What is the trend in non-training mission constraints by all TIES species according to the DPT on installations grouped by category?
DPT - Non-training Mission Constraints	Summary <Category>	Level of Interest, Federal Status, Year	Spreadsheet and Graph	Answers general information need on installations, including installation name, service, major command, state, country(ies), or total acreage.
Installation Info	<OK>	A available Installation, Available Information	Spreadsheet	

Figure C1. Inputs and outputs for buttons and dialog boxes in TRACKER's Canned Query Component.

## **Appendix D: Logic Definition for TRACKER's Ad Hoc Query Component**



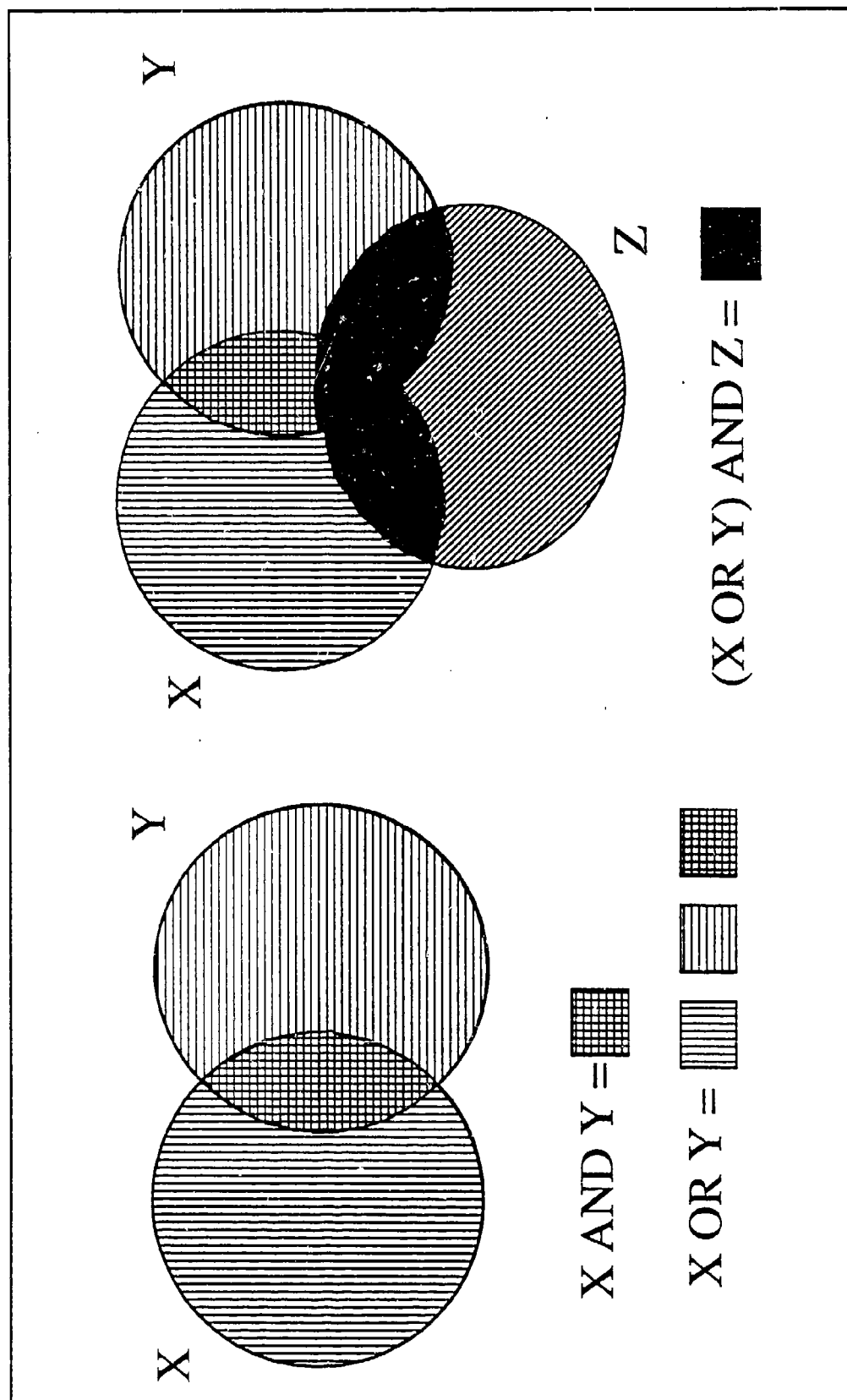


Figure D1. VENN diagrams for logic used in "Where Clause" development.

# Appendix E: Table and Data Definitions for the Query and Summary Component of TRACKER

<b>N_TRAIN_MISS</b>	Code values for Non-training Mission Trend - administrative use only
NON_TRAIN_MISS	Effect of element on non-training mission - code values
RESPONSE	Code definitions
<b>O_MISSION_TR</b>	Code values for Overall Mission Trend - administrative use only
OVERALL_MISSION_TR	Effect of element on overall mission - code values
RESPONSE	Code definitions
<b>TAXONOMY</b>	Complete taxonomic description for each species, from kingdom down to subspecies or variety level
SPPCODE	Species code for the element
ELCODE	Element code (BCD)
COM_NAME	Common name for the element
KINGDOM	Kingdom of the element
PHYLUM	Phylum of the element
TAXON	Describer of taxon, year described, narrative on any taxonomic dispute
GROUP	Group of the element
CLASS	Class of the element
ORDER	Order of the element
FAMILY	Family of the element
GENUS	Genus of the element
SPECIES	Species of the element
SUBSPECIES	Subspecies of the element
VARIETY	Variety of the element
OTHCOMNAME	Other common names for the element
COM_FAM_NAME	Other common family names for the element
HIST_SCI_NAME	Historical scientific names for the element
LCTASPPCODE	LCTA code for the element
BLMSPPCODE	BLM code for the element
USFWSSPPCODE	USFWS code for the element
CAT	Generic category for the element

**T\_DEH\_MISS\_C** Change in constraints on DEH training mission, non-training mission, and overall mission due to presence of particular species on an installation

SPPCODE	Code for the element
INCODE	Code for the installation
OVERALL_MISSION_TR	Change in overall mission constraints due to elements
MISSION	Description of the mission
ORG	Organization of the point of contact (POC)
YR	Current year when the mission constraint information was entered
MIS_CONSTRAINTS	Constraints on the mission due to the element
NON_TRAIN_MISS	Constraints on the non-training mission due to the element

**T\_DPT\_MIS\_C** Change in constraints on DPT training mission, non-training mission, and overall mission due to presence of particular species on an installation

INCODE	Code for the installation
SPPCODE	Code for the element
TRAIN_MISSION_TREND	Change in training mission constraints due to elements
MISSION	Description of the mission
ORG	Organization of the point of contact (POC)
YR	Current year when the mission constraint information was entered
MIS_CONSTRAINTS	Constraints on the mission due to the element
NON_TRAIN_MISS	Constraints on the non-training mission due to the element

**T\_FUNDING** Funding information for individual species on installations

SPPCODE	Code for element
INCODE	Code for the installation
YR	Current year when the information was entered
PREV_YR_FUND	Previous years funding
CURR_YR_FUND	Current year funding
NEXT_YR_FUND	Following years funding
SOURCE	Funding source(s)

**T\_INST\_CONT** Information on point of contact for each installation

INCODE	Code for the installation
IDCODE	Code for the point of contact (POC) person
FIR_NAME	First name of the point of contact (POC) for the installation
MID_NAME	Middle name of the point of contact (POC) for the installation
LAS_NAME	Last name of the point of contact (POC) for the installation
TITLE	Title of the point of contact (POC)
POSITION	Position of the point of contact (POC)
OFFICE	Office of the point of contact (POC)
YR	Year information was entered
ADDRESS	Address of the point of contact (POC)
CITY	City of the point of contact (POC)
ST	State of the point of contact (POC)
ZIPCODE	Zipcode of the point of contact (POC)
ORG	Organization of the point of contact (POC)
P_AREA	Phone area code of the point of contact (POC)

P_PRE	Phone prefix of the point of contact (POC)
P_POST	Phone post-fix
P_EXT	Phone extension
F_AREA	FAX area code
F_PRE	FAX prefix
F_POST	FAX post-fix
DSN_PRE	DSN prefix
DSN_POST	DSN post-fix

**T\_INST\_INFO****Information about each installation**

INCODE	Code for the installation
INSTALLATION	Installation name
ST	State of the installation
MACOM	Major command of the installation
SERVICE	Military branch of the installation
QUAD	USGS quadrant
COUNTIES	Counties in which the installation resides
SURROUNDING_COUNTIES	Counties surrounding the installation
TOT_ACRES	Total acres of the installation
FIPSZONE	FIPS zone code
FIPSCODE	FIPS county code(s)
BRAC	Base restructuring and closing
BRAC_DATE	Base restructuring and closing date
YR	Year information was provided

**T\_RES\_ACRES****Total restricted acres for (named) species on (named) installation**

SPPCODE	Code for element
INCODE	Code for the installation
REST_ACRES_TOT	Total restricted acres due to element or habitat
YR	Year information was provided

**T\_SPP\_OCCUR****Information on known or potential existence of (named) species on (named) installation**

SPPCODE	Code for element
INCODE	Code for the installation
ST	States where the installation resides
FED_STAT	Federal status of the species
FED_DATE	Date of the Federal Register listing from which the information was taken
SPP_OCCUR	Known or potential element occurrence on installation
SPP_RESIDENCE	Periodicity of residency for element on installation
SPP_TREND	General trend of the element's existence on the installation
YR	Year information was provided
ST_DATE	Date of most recent document received on state statuses from that state
ST_STAT	State status of the element
OFFICIAL_UN	Whether listing is official (covered by state law) or unofficial

**TRAIN\_M\_TR****TRAIN\_MISSION\_TREND****Codes for training mission trend****RESPONSE****Definition of training mission trend codes**

# Appendix F: Table and Data Definitions for the Automated Input Forms Component of TRACKER

## **NEW INSTALLATION**      Enter a new installation into the database and assign a temporary INCODE

<b>INSTALLATION NAME</b>	Full name of the installation in upper case
<b>SERVICE</b>	Army, Navy, AFB, NGB, Marine, etc.
<b>MAJOR COMMAND</b>	FORSCOM, TRADOC, etc.
<b>TOTAL ACREAGE</b>	Total acreage for the installation to the nearest whole acre
<b>COUNTY(IES)</b>	List of counties where the installation resides in upper case
<b>SURROUNDING COUNTIES</b>	List of counties surrounding the installation in upper case
<b>CURRENT YEAR</b>	Date stamp for information in the database

## **NEW TES SPECIES**      Enter a new element into the database and assign a temporary SPPCODE

<b>KINGDOM</b>	Kingdom for the element in upper case
<b>PHYLUM</b>	Phylum for the element in upper case
<b>CLASS</b>	Class for the element in upper case
<b>ORDER</b>	Order for the element in upper case
<b>FAMILY</b>	Family for the element in upper case
<b>GENUS</b>	Genus for the element in upper case
<b>SPECIES</b>	Species for the element in upper case
<b>SUBSPECIES</b>	Subspecies for the element in upper case
<b>VARIETY</b>	Variety for the element in upper case
<b>COMMON NAME</b>	Common Name for the element in upper case
<b>CATEGORY</b>	Taxonomic category for the element
<b>CURRENT YEAR</b>	Date stamp for information in the database

## **SPECIES OCCURRENCE**      Information on known or potential existence of (named) species on (named) installation

<b>INSTALLATION</b>	List of (named) installation from database
<b>SPECIES</b>	List of (named) species from database
<b>COMMON NAME</b>	Common name populated from the database and the SPECIES list box
<b>CURRENT YEAR</b>	Date stamp for information in the database
<b>SPECIES OCCURRENCE</b>	Known or suspected occurrence of (named) species
<b>TYPE OF OCCURRENCE</b>	Permanent, seasonal, or visitor of (named) species

## **FUNDING**      Funding information for individual species on installations

<b>INSTALLATION</b>	List of (named) installation from database
---------------------	--

<b>SPECIES</b>	List of (named) species from database
<b>COMMON NAME</b>	Common name populated from the database and the SPECIES list box
<b>PREVIOUS YEAR'S FUNDING</b>	Funding (nearest whole dollar) for previous year to CURRENT YEAR
<b>CURRENT YEAR'S FUNDING</b>	Funding (nearest whole dollar) for CURRENT YEAR entry
<b>NEXT YEAR'S FUNDING</b>	Funding (nearest whole dollar) for year following CURRENT YEAR
<b>CURRENT YEAR</b>	Date stamp for information in the database

**MISSION CONSTRAINTS** Mission Constraints on a (named) installation by a (named) species as reported by the environmental office or the trainers

<b>INSTALLATION</b>	List of (named) installation from database
<b>SPECIES</b>	List of (named) species from database
<b>COMMON NAME</b>	Common name populated from the database and the SPECIES list box
<b>ORGANIZATION</b>	DPT or DEH selection
<b>CURRENT YEAR</b>	Date stamp for information in the database
<b>TRAINING MISSION</b>	Increased, decreased, or unchanged selection for trend
<b>NON-TRAINING MISSION</b>	Increased, decreased, or unchanged selection for trend
<b>OVERALL MISSION</b>	Increased, decreased, or unchanged selection for trend

**RESTRICTED ACRES** Total restricted acres for (named) species on (named) installation

<b>INSTALLATION</b>	List of (named) installation from database
<b>SPECIES</b>	List of (named) species from database
<b>COMMON NAME</b>	Common name populated from the database and the SPECIES list box
<b>RESTRICTED ACRES</b>	Restricted acreage due to (named) species to nearest whole acre
<b>CURRENT YEAR</b>	Date stamp for information in the database

## DISTRIBUTION

Chief of Engineers

ATTN: CEHEC-IM-LH (2)

ATTN: CEHEC-IM-LP (2)

ATTN: CECC-R

ATTN: CERD-L

ATTN: CERD-M

HQ, TRADOC

ATTN: ATBO-SE

Fort Monroe, VA 23641-5000

HQ, FORSCOM

ATTN: AFPI-ENE

ATTN: AFOP-TE

Fort McPherson, GA 30330-6000

USASC & FG

Fort Gordon, GA 30905-5040

U.S. Army Material Command

Installation & Services Activity

ATTN: AMXEN-U

Rock Island, IL 61299-7190

Natural Resources Management Office

ATTN: ATZC-DOE-C

Fort Bliss, TX 79916

U.S. Army Environmental Center

ATTN: SRIM-AEC-ECN (2)

ATTN: SFIM-AEC-ET

ATTN: SFIM-ARC-ECN

Aberdeen Proving Ground, MD

21010-5401

US Army TEC

Humphrey's Engineering Center

Alexandria, VA 22310-5000

HQ, USARPAC

ATTN: APEN-EV

Fort Shafter, HI 96858-5100

Michigan Army National Guard

Lansing, MI 48913

Department of Army

Environmental Programs Directorate

ATTN: NGB-ARE

Arlington, VA 22204-1382

HQDA

ATTM: DAMO-TRO

Washington DC 20310-0400

USAEWES

ATTN: CEWES-EN-S

Vicksburg, MS 39180-6199

HQDA, ACSIM

ATTN: DAIM-ED-N (2)

Washington DC 20310-0600

HQ, U.S. Army Reserve Command

ATTN: AFAC-ENV-RC

Atlanta, GA 30331-5099

US Army Training Support Center

ATTN: ATSC-CTS

Fort Eustis, VA 23604

Defense Tech Info Center 22304

ATTN: DTIC-O (2)

29

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